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To: Steve Morrow
From: Chris Ricardi
Date: October 23, 2009
Subject: Interim Response Steps Work Plan Slurry Wall Monitoring Program 2Q09– May 2009

**DATA VALIDATION REPORT
MAY 2009 SLURRY WALL SURFACE WATER AND GROUNDWATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS
TestAmerica Laboratories Data Sets 360-22588, 360-22595, and 360-22658**

1.0 INTRODUCTION

Surface water and groundwater samples were collected from the Olin Chemical Superfund Site from May 11 to May 15, 2009. Samples were analyzed by TestAmerica Laboratories in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-22588, 360-22595, and 360-22658. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- dissolved and total metals (aluminum, chromium, and sodium) by USEPA Method 6010B in surface water
- dissolved metals (aluminum and chromium) by USEPA Method 6010B in groundwater
- general chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1), chloride, sulfate, nitrate, and nitrite by USEPA Method 300, and specific conductance by SM18 SM 2510B

The Draft Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2004] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington annual and quarterly groundwater monitoring tasks. Final sample results are presented on data summaries in Table 2.

2.0 METALS

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time
- * Blanks
- * Matrix Spike Analysis
- * Laboratory Duplicate Analysis
- * Field Duplicate Results
- * Laboratory Control Sample

- * Detection limits
Dissolved vs. Total Metals Comparison

* = indicates that criteria were met for this parameter

Blanks

Dissolved aluminum (3.6 µg/L) was reported in the method blank associated with all samples in SDG 360-22588. An action level (18 µg/L) was calculated at five times the blank concentration and compared to sample data. The low concentration detection of dissolved aluminum in sample OC-ISCO-2 was qualified non-detect (U) at the reporting limit.

The laboratory qualified sample results with a (B) when the analyte was detected in the sample and associated method blank. The (B) qualifier was removed from the final data set.

Dissolved vs. Total Metals Comparison

Dissolved sodium concentrations are significantly greater than total sodium concentrations reported in a subset of samples in SDG 360-22588. The results for total and dissolved sodium in samples OC-ISCO-1, OC-ISCO-2, OC-ISCO-3, OC-PZ16RRSW, OC-PZ18RSW, and OC-SD17 are qualified estimated (J).

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time
- * Blanks
- * Matrix Spike Analysis
- * Laboratory Duplicate Analysis
- * Laboratory Control Sample
- * Detection limits

* = indicates that criteria were met for this parameter

Matrix Spike Results

An ammonia MS/MSD analysis was completed using sample OC-GW-34D. The ammonia MSD percent recovery (160) is greater than the upper project limit of 125. The relative percent difference (RPD) between the ammonia MS and MSD (25) is greater than the project QC limit of 20. The result for ammonia in the unspiked samples OC-GW-34D and OC-GW34D DUP were qualified estimated (J).

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.



8/26/09

Chris Ricardi, NRCC-EAC
Senior Chemist

Date



Michael Murphy
Project Principal

Date

10/28/09

References:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; July 25, 2007.

Massachusetts Department of Environmental Protection (MassDEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

Table 1
Sample Summary - Sets 360-22588-1, 360-22595-1, and 360-22658-1
Data Validation Report
May 2009 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				E350.1			
				SW846 6010B	SW846 6010B	(QuickChem	40CFR136A
Lab Sample ID	Location	Sample ID	Sample Date	Total	Filtered	10-107-06-1-B)	SM 2510B 300.0
Groundwater							
360-22595-1	GW-42S	OC-GW-42S	5/11/2009		2	1	1 2
360-22595-2	GW-201S	OC-GW-201S	5/12/2009		2	1	1 2
360-22595-3	GW-35S	OC-GW-35S	5/12/2009		2	1	1 2
360-22658-1	GW-10S	OC-GW-10S	5/13/2009		2	1	1 2
360-22658-2	GW-26	OC-GW-26	5/13/2009		2	1	1 2
360-22658-3	GW-76S	OC-GW-76S	5/13/2009		2	1	1 2
360-22658-4	GW-25	OC-GW-25	5/13/2009		2	1	1 2
360-22658-5	PZ-18	OC-PZ-18R	5/13/2009		2	1	1 2
360-22658-6	GW-39	OC-GW-39	5/13/2009		2	1	1 2
360-22658-7	GW-34SR	OC-GW-34SR	5/13/2009		2	1	1 2
360-22658-8	GW-34D	OC-GW-34D	5/13/2009		2	1	1 2
360-22658-9	GW-34D	OC-GW-34D DUP	5/13/2009		2	1	1 2
360-22658-10	GW-55S	OC-GW-55S	5/14/2009		2	1	1 2
360-22658-11	PZ-17RR	OC-PZ-17RR	5/14/2009		2	1	1 2
360-22658-12	GW-CA1	OC-GW-CA1	5/14/2009		2	1	1 2
360-22658-13	GW-78S	OC-GW-78S	5/14/2009		2	1	1 2
360-22658-14	GW-24	OC-GW-24	5/14/2009		2	1	1 2
360-22658-15	PZ-16RR	OC-PZ-16RR	5/14/2009		2	1	1 2
360-22658-16	GW-202D	OC-GW-202D	5/15/2009		2	1	1 2
360-22658-17	GW-202S	OC-GW-202S	5/15/2009		2	1	1 2
360-22658-18	GW-79S	OC-GW-79S	5/15/2009		2	1	1 2
Surface Water							
360-22588-1	ISCO3	OC-ISCO-3	5/12/2009	3	3	1	1 4
360-22588-2	ISCO2	OC-ISCO-2	5/12/2009	3	3	1	1 4
360-22588-3	PZ-16RR	OC-PZ16RRSW	5/12/2009	3	3	1	1 4
360-22588-4	PZ-17RR	OC-PZ17RRSW	5/12/2009	3	3	1	1 4
360-22588-5	SD-17	OC-SD17	5/12/2009	3	3	1	1 4
360-22588-6	PZ-18R	OC-PZ18RSW	5/12/2009	3	3	1	1 4
360-22588-7	ISCO1	OC-ISCO-1	5/12/2009	3	3	1	1 4

Notes:

Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 06/02/09

Checked by / Date: WDC 07/29/09

Table 2
Final Results Summary - 360-22588-1, 360-22595-1 & 360-22658-1
May 2009 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				GW-10S		GW-201S		GW-202D		GW-202S		GW-24		GW-25		GW-26	
				OC-GW-10S		OC-GW-201S		OC-GW-202D		OC-GW-202S		OC-GW-24		OC-GW-25		OC-GW-26	
				05/13/09		05/12/09		05/15/09		05/15/09		05/14/09		05/13/09		05/13/09	
				FS		FS		FS		FS		FS		FS		FS	
				360-22658-1		360-22595-1		360-22658-1		360-22658-1		360-22658-1		360-22658-1		360-22658-1	
				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	3100		100 U		18000		3.7 J		4 J		100 U		2.9 J	
F	SW6010	Chromium	ug/l	5 U		14		1200		4.6 J		5 U		3.7 J		20	
N	E300	Chloride	mg/l	5.2		24		370		53		6.3		37		180	
N	E300	Sulfate	mg/l	41		1300		2600		490		68		120		160	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	1		72		360		120		36		53		74	
N	SM2510B	LAB SPECIFIC CONDUCTANC	umhos/cm	110		2500		5000		1300		350		570		1000	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary - 360-22588-1, 360-22595-1 & 360-22658-1
May 2009 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				GW-34D		GW-34D		GW-34SR		GW-35S		GW-39		GW-42S		GW-55S	
				OC-GW-34D		OC-GW-34D DUP		OC-GW-34SR		OC-GW-35S		OC-GW-39		OC-GW-42S		OC-GW-55S	
				05/13/09		05/13/09		05/13/09		05/12/09		05/13/09		05/11/09		05/14/09	
				FS		FD		FS		FS		FS		FS		FS	
				360-22658-1		360-22658-1		360-22658-1		360-22595-1		360-22658-1		360-22595-1		360-22658-1	
				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	4 J		4.7 J		100 U		25 J		91 J		515		470	
F	SW6010	Chromium	ug/l	13		13		0.52 J		16		5 U		12		1.8 J	
N	E300	Chloride	mg/l	14		15		1.1		6.6		19		67		180	
N	E300	Sulfate	mg/l	37		38		7.1		400		500		8		1100	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	15 J		14 J		0.27		19		0.15		0.37		15	
N	SM2510B	LAB SPECIFIC CONDUCTANC	umhos/cm	210		210		65		1000		910		310		2800	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary - 360-22588-1, 360-22595-1 & 360-22658-1
May 2009 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				GW-76S OC-GW-76S 05/13/09 FS 360-22658-1		GW-78S OC-GW-78S 05/14/09 FS 360-22658-1		GW-79S OC-GW-79S 05/15/09 FS 360-22658-1		GW-CA1 OC-GW-CA1 05/14/09 FS 360-22658-1		PZ-16RR OC-PZ-16RR 05/14/09 FS 360-22658-1		PZ-17RR OC-PZ-17RR 05/14/09 FS 360-22658-1		PZ-18 OC-PZ-18R 05/13/09 FS 360-22658-1	
				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	7.2	J	3.4	J	18	J	6	J	100	U	100	U	3.6	J
F	SW6010	Chromium	ug/l	2.4	J	3.5	J	6.6		0.92	J	7.4		3.2	J	18	
N	E300	Chloride	mg/l	11		21		190		2.1		160		18		180	
N	E300	Sulfate	mg/l	38		620		1300		39		950		550		240	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	11		71		190		0.4		190		62		62	
N	SM2510B	LAB SPECIFIC CONDUCTANC	umhos/cm	170		1400		3320		390		2600		1400		1200	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date: KJC 07/30/09

Checked by / Date: WDC 07/30/09

Table 2
Final Results Summary - 360-22588-1, 360-22595-1 & 360-22658-1
May 2009 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				ISCO1 OC-ISCO-1 05/12/09 FS 360-22588-1		ISCO2 OC-ISCO-2 05/12/09 FS 360-22588-1		ISCO3 OC-ISCO-3 05/12/09 FS 360-22588-1		PZ-16RR OC-PZ16RRSW 05/12/09 FS 360-22588-1		PZ-17RR OC-PZ17RRSW 05/12/09 FS 360-22588-1		PZ-18R OC-PZ18RSW 05/12/09 FS 360-22588-1		SD-17 OC-SD17 05/12/09 FS 360-22588-1	
				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	98 J		17 U		250		20 J		100		94 J		130	
F	SW6010	Chromium	ug/l	12		4 J		50		12		68		12		72	
F	SW6010	Sodium	ug/l	84000 J		100000 J		100000 J		110000 J		120000		82000 J		120000 J	
N	E300	Chloride	mg/l	120		140		140		160		160		120		160	
N	E300	Nitrate as N	mg/l	0.23		3.9		3.7		4.4		4		0.25		4.1	
N	E300	Nitrite as N	mg/l	0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U	
N	E300	Sulfate	mg/l	110		190		190		180		220		120		220	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	24		34		41		18		36		25		35	
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	700		980		960		1000		1100		700		1100	
T	SW6010	Aluminum	ug/l	210		2500		2700		2400		2500		180		2300	
T	SW6010	Chromium	ug/l	26		530		590		540		600		22		580	
T	SW6010	Sodium	ug/l	75000 J		87000 J		84000 J		92000 J		110000		65000 J		100000 J	

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date: KJC 07/30/09

Checked by / Date: WDC 07/30/09

ANALYTICAL REPORT

Job Number: 360-22588-1

Job Description: Slurry Wall/Cap

For:

Olin Corporation

3855 North Ocoee Street

Suite 200

Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:



Approved for release.
Joe Chimi
Report Production Representative
5/27/09 4:10 PM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
05/27/2009

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory.

TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.

Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085

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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-22588-1
Project Location: Slurry Wall / Cap	MADEP RTN ¹ :
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-22588-(1-7)	
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:
MCP SW-846 Methods Used	8260B() 8151A () 8330 () 6010B (x) 7470A/1A () Other ()
	8270C() 8081A () VPH () 6020 () 9014M ² /9012 ()
	8082 () 8021B () EPH () 7000 S ³ () 7196A ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: 

Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 5/27/09 16:01

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
53 Southampton Rd,
Westfield, MA 01085
Tel:(413)572-4000
Fax:(413)572-3707

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-22588-1
Project Location: Slurry Wall / Cap	MADEP RTN ¹ :
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-22588-(1-7)	
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:
MCP SW-846 Methods Used	8260B () 8151A () 8330 () 6010B () 7470A/1A () Other (x)
	8270C () 8081A () VPH () 6020 () 9014M ² /9012 ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 () 8021B () EPH () 7000 S ³ () 7196A ()
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.	

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 5/27/09 16:01

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



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CASE NARRATIVE

Client: Olin Corporation

Project: Slurry Wall/Cap

Report Number: 360-22588-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 05/13/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.2°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

TOTAL METALS

Samples 360-22588-1 through 360-22588-7 were analyzed for total metals in accordance with EPA SW846 Method 6010B. The samples were prepared and analyzed on 05/14/2009.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

DISSOLVED METALS

Samples 360-22588-1 through 360-22588-7 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 05/14/2009.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

Aluminum was detected in method blank MB 360-44463/2 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

ANIONS

Samples 360-22588-1 through 360-22588-7 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 05/13/2009.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-22588-1 through 360-22588-7(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentration.

AMMONIA

Samples 360-22588-1 through 360-22588-7 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 05/22/2009.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-22588-1(5X), 360-22588-2(5X) and 360-22588-4 through 360-22588-7(5X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high concentration.

SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Samples 360-22588-1 through 360-22588-7 were analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 05/13/2009.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22588-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22588-1	OC-ISCO-3				
Aluminum		2700	100	ug/L	6010B
Chromium		590	5.0	ug/L	6010B
Sodium		84000 J	2000	ug/L	6010B
Sulfate		190	20	mg/L	300.0
Nitrate as N		3.7	0.050	mg/L	300.0
Chloride		140	10	mg/L	300.0
Ammonia		41	0.50	mg/L	L107-06-1B
Specific Conductance		960	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		250 B	100	ug/L	6010B
Chromium		50	5.0	ug/L	6010B
Sodium		100000 J	2000	ug/L	6010B
360-22588-2	OC-ISCO-2				
Aluminum		2500	100	ug/L	6010B
Chromium		530	5.0	ug/L	6010B
Sodium		87000 J	2000	ug/L	6010B
Sulfate		190	20	mg/L	300.0
Nitrate as N		3.9	0.050	mg/L	300.0
Chloride		140	10	mg/L	300.0
Ammonia		34	0.50	mg/L	L107-06-1B
Specific Conductance		980	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		17 J-B	100	ug/L	6010B
Chromium		4.0 J	5.0	ug/L	6010B
Sodium		100000 J	2000	ug/L	6010B
360-22588-3	OC-PZ16RRSW				
Aluminum		2400	100	ug/L	6010B
Chromium		540	5.0	ug/L	6010B
Sodium		92000 J	2000	ug/L	6010B
Sulfate		180	20	mg/L	300.0
Nitrate as N		4.4	0.050	mg/L	300.0
Chloride		160	10	mg/L	300.0
Ammonia		18	0.10	mg/L	L107-06-1B
Specific Conductance		1000	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		20 J-B	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
Sodium		110000 J	2000	ug/L	6010B

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EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22588-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22588-4	OC-PZ17RRSW				
Aluminum		2500	100	ug/L	6010B
Chromium		600	5.0	ug/L	6010B
Sodium		110000	2000	ug/L	6010B
Sulfate		220	20	mg/L	300.0
Nitrate as N		4.0	0.050	mg/L	300.0
Chloride		160	10	mg/L	300.0
Ammonia		36	0.50	mg/L	L107-06-1B
Specific Conductance		1100	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		100 B	100	ug/L	6010B
Chromium		68	5.0	ug/L	6010B
Sodium		120000	2000	ug/L	6010B
360-22588-5	OC-SD17				
Aluminum		2300	100	ug/L	6010B
Chromium		580	5.0	ug/L	6010B
Sodium		100000 J	2000	ug/L	6010B
Sulfate		220	20	mg/L	300.0
Nitrate as N		4.1	0.050	mg/L	300.0
Chloride		160	10	mg/L	300.0
Ammonia		35	0.50	mg/L	L107-06-1B
Specific Conductance		1100	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		130 B	100	ug/L	6010B
Chromium		72	5.0	ug/L	6010B
Sodium		120000 J	2000	ug/L	6010B
360-22588-6	OC-PZ18RSW				
Aluminum		180	100	ug/L	6010B
Chromium		22	5.0	ug/L	6010B
Sodium		65000 J	2000	ug/L	6010B
Sulfate		120	20	mg/L	300.0
Nitrate as N		0.25	0.050	mg/L	300.0
Chloride		120	10	mg/L	300.0
Ammonia		25	0.50	mg/L	L107-06-1B
Specific Conductance		700	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		94 JB	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
Sodium		82000 J	2000	ug/L	6010B

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EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22588-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22588-7	OC-ISCO-1				
Aluminum		210	100	ug/L	6010B
Chromium		26	5.0	ug/L	6010B
Sodium		75000 J	2000	ug/L	6010B
Sulfate		110	20	mg/L	300.0
Nitrate as N		0.23	0.050	mg/L	300.0
Chloride		120	10	mg/L	300.0
Ammonia		24	0.50	mg/L	L107-06-1B
Specific Conductance		700	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		98 J.B.	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
Sodium		84000 J	2000	ug/L	6010B

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METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-22588-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Dissolved Metals	TAL WFD	SW846 6010B	
Total Metals	TAL WFD	SW846 6010B	
Sample Filtration, Field	TAL WFD		FIELD_FLTRD
Preparation, Total Metals	TAL WFD		SW846 3010A
Chloride & Sulfate	TAL WFD	40CFR136A 300.0	
Nitrate & Nitrite	TAL WFD	40CFR136A 300.0	
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B	
Distillation, Ammonia	TAL WFD		Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B	

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-22588-1

Method	Analyst	Analyst ID
SW846 6010B	Nasiatka, Ellen M	EMN
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-22588-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-22588-1	OC-ISCO-3	Water	05/12/2009 1240	05/13/2009 0950
360-22588-2	OC-ISCO-2	Water	05/12/2009 1310	05/13/2009 0950
360-22588-3	OC-PZ16RRSW	Water	05/12/2009 1315	05/13/2009 0950
360-22588-4	OC-PZ17RRSW	Water	05/12/2009 1355	05/13/2009 0950
360-22588-5	OC-SD17	Water	05/12/2009 1345	05/13/2009 0950
360-22588-6	OC-PZ18RSW	Water	05/12/2009 1405	05/13/2009 0950
360-22588-7	OC-ISCO-1	Water	05/12/2009 1420	05/13/2009 0950

SAMPLE RESULTS

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Job Number: 360-22588-1

Client Sample ID: OC-ISCO-3
Lab Sample ID: 360-22588-1

Date Sampled: 05/12/2009 1240
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed: 05/14/2009 1824		
Aluminum	250 .B	ug/L	2.2	100	1.0
Chromium	50	ug/L	0.17	5.0	1.0
Sodium	100000 J	ug/L	65	2000	1.0
Method: 6010B			Date Analyzed: 05/14/2009 1631		
Prep Method: 3010A			Date Prepared: 05/14/2009 0712		
Aluminum	2700	ug/L	2.2	100	1.0
Chromium	590	ug/L	0.17	5.0	1.0
Sodium	84000 J	ug/L	65	2000	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-ISCO-3
Lab Sample ID: 360-22588-1

Date Sampled: 05/12/2009 1240
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Nitrate as N	3.7	mg/L	0.050	0.050	1.0
Method: 300.0					
Sulfate	190	mg/L	20	20	10
Chloride	140	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	41	mg/L	0.50	0.50	5.0
Method: SM 2510B					
Specific Conductance	960	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-ISCO-2
Lab Sample ID: 360-22588-2

Date Sampled: 05/12/2009 1310
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/14/2009 1827	
Aluminum	17 100 u J-B	ug/L	2.2	100	1.0
Chromium	4.0 J	ug/L	0.17	5.0	1.0
Sodium	100000 J	ug/L	65	2000	1.0
Method: 6010B			Date Analyzed:	05/14/2009 1634	
Prep Method: 3010A			Date Prepared:	05/14/2009 0712	
Aluminum	2500	ug/L	2.2	100	1.0
Chromium	530	ug/L	0.17	5.0	1.0
Sodium	87000 J	ug/L	65	2000	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-ISCO-2
Lab Sample ID: 360-22588-2

Date Sampled: 05/12/2009 1310
 Date Received: 05/13/2009 0950
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Date Analyzed: 05/13/2009 1907					
Nitrate as N	3.9	mg/L	0.050	0.050	1.0
Method: 300.0 Date Analyzed: 05/13/2009 1922					
Sulfate	190	mg/L	20	20	10
Chloride	140	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B Date Analyzed: 05/22/2009 1410 Prep Method: Distill/Ammonia Date Prepared: 05/22/2009 0850					
Ammonia	34	mg/L	0.50	0.50	5.0
Method: SM 2510B Date Analyzed: 05/13/2009 1332					
Specific Conductance	980	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-PZ16RRSW
Lab Sample ID: 360-22588-3

Date Sampled: 05/12/2009 1315
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/14/2009 1829	
Aluminum	20 JB	ug/L	2.2	100	1.0
Chromium	12	ug/L	0.17	5.0	1.0
Sodium	110000 S	ug/L	65	2000	1.0
Method: 6010B			Date Analyzed:	05/14/2009 1637	
Prep Method: 3010A			Date Prepared:	05/14/2009 0712	
Aluminum	2400	ug/L	2.2	100	1.0
Chromium	540	ug/L	0.17	5.0	1.0
Sodium	92000 S	ug/L	65	2000	1.0


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Job Number: 360-22588-1

Client Sample ID: OC-PZ16RRSW
Lab Sample ID: 360-22588-3

Date Sampled: 05/12/2009 1315
 Date Received: 05/13/2009 0950
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Date Analyzed: 05/13/2009 1937					
Nitrate as N	4.4	mg/L	0.050	0.050	1.0
Method: 300.0 Date Analyzed: 05/13/2009 1952					
Sulfate	180	mg/L	20	20	10
Chloride	160	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B Date Analyzed: 05/22/2009 1356					
Prep Method: Distill/Ammonia Date Prepared: 05/22/2009 0850					
Ammonia	18	mg/L	0.10	0.10	1.0
Method: SM 2510B Date Analyzed: 05/13/2009 1334					
Specific Conductance	1000	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-PZ17RRSW
Lab Sample ID: 360-22588-4

Date Sampled: 05/12/2009 1355
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/14/2009 1832	
Aluminum	100 -B	ug/L	2.2	100	1.0
Chromium	68	ug/L	0.17	5.0	1.0
Sodium	120000	ug/L	65	2000	1.0
Method: 6010B			Date Analyzed:	05/14/2009 1639	
Prep Method: 3010A			Date Prepared:	05/14/2009 0712	
Aluminum	2500	ug/L	2.2	100	1.0
Chromium	600	ug/L	0.17	5.0	1.0
Sodium	110000	ug/L	65	2000	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-PZ17RRSW
Lab Sample ID: 360-22588-4

Date Sampled: 05/12/2009 1355
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	05/13/2009 2108	
Nitrate as N	4.0	mg/L	0.050	0.050	1.0
Method: 300.0			Date Analyzed:	05/13/2009 2123	
Sulfate	220	mg/L	20	20	10
Chloride	160	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B			Date Analyzed:	05/22/2009 1411	
Prep Method: Distill/Ammonia			Date Prepared:	05/22/2009 0850	
Ammonia	36	mg/L	0.50	0.50	5.0
Method: SM 2510B			Date Analyzed:	05/13/2009 1335	
Specific Conductance	1100	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-SD17
Lab Sample ID: 360-22588-5

Date Sampled: 05/12/2009 1345
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed: 05/14/2009 1835		
Aluminum	130 <i>B</i>	ug/L	2.2	100	1.0
Chromium	72	ug/L	0.17	5.0	1.0
Sodium	120000 <i>J</i>	ug/L	65	2000	1.0
Method: 6010B			Date Analyzed: 05/14/2009 1642		
Prep Method: 3010A			Date Prepared: 05/14/2009 0712		
Aluminum	2300	ug/L	2.2	100	1.0
Chromium	580	ug/L	0.17	5.0	1.0
Sodium	100000 <i>J</i>	ug/L	65	2000	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-SD17
Lab Sample ID: 360-22588-5

Date Sampled: 05/12/2009 1345
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Date Analyzed: 05/13/2009 2208					
Method: 300.0 Nitrate as N	4.1	mg/L	0.050	0.050	1.0
Date Analyzed: 05/13/2009 2224					
Method: 300.0 Sulfate	220	mg/L	20	20	10
Chloride	160	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Date Analyzed: 05/22/2009 1412					
Date Prepared: 05/22/2009 0850					
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	35	mg/L	0.50	0.50	5.0
Date Analyzed: 05/13/2009 1337					
Method: SM 2510B Specific Conductance	1100	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-PZ18RSW
Lab Sample ID: 360-22588-6

Date Sampled: 05/12/2009 1405
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/14/2009 1844	
Aluminum	94 JB	ug/L	2.2	100	1.0
Chromium	12	ug/L	0.17	5.0	1.0
Sodium	82000 J	ug/L	65	2000	1.0
Method: 6010B			Date Analyzed:	05/14/2009 1645	
Prep Method: 3010A			Date Prepared:	05/14/2009 0712	
Aluminum	180	ug/L	2.2	100	1.0
Chromium	22	ug/L	0.17	5.0	1.0
Sodium	65000 J	ug/L	65	2000	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-PZ18RSW
Lab Sample ID: 360-22588-6

Date Sampled: 05/12/2009 1405
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Date Analyzed: 05/13/2009 2239					
Method: 300.0 Nitrate as N	0.25	mg/L	0.050	0.050	1.0
Date Analyzed: 05/13/2009 2254					
Method: 300.0 Sulfate	120	mg/L	20	20	10
Chloride	120	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Date Analyzed: 05/22/2009 1413					
Date Prepared: 05/22/2009 0850					
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	25	mg/L	0.50	0.50	5.0
Date Analyzed: 05/13/2009 1338					
Method: SM 2510B Specific Conductance	700	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-ISCO-1
Lab Sample ID: 360-22588-7

Date Sampled: 05/12/2009 1420
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/14/2009 1847	
Aluminum	98 J.B.	ug/L	2.2	100	1.0
Chromium	12	ug/L	0.17	5.0	1.0
Sodium	84000 J	ug/L	65	2000	1.0
Method: 6010B			Date Analyzed:	05/14/2009 1648	
Prep Method: 3010A			Date Prepared:	05/14/2009 0712	
Aluminum	210	ug/L	2.2	100	1.0
Chromium	26	ug/L	0.17	5.0	1.0
Sodium	75000 J	ug/L	65	2000	1.0

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Job Number: 360-22588-1

Client Sample ID: OC-ISCO-1
Lab Sample ID: 360-22588-7

Date Sampled: 05/12/2009 1420
Date Received: 05/13/2009 0950
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Date Analyzed: 05/13/2009 2309					
Method: 300.0 Nitrate as N	0.23	mg/L	0.050	0.050	1.0
Date Analyzed: 05/13/2009 2324					
Method: 300.0 Sulfate	110	mg/L	20	20	10
Chloride	120	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Date Analyzed: 05/22/2009 1414					
Date Prepared: 05/22/2009 0850					
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	24	mg/L	0.50	0.50	5.0
Date Analyzed: 05/13/2009 1340					
Method: SM 2510B Specific Conductance	700	umhos/cm	1.0	1.0	1.0

DATA REPORTING QUALIFIERS

Client: Olin Corporation

Job Number: 360-22588-1

Lab Section	Qualifier	Description
Metals	B	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 360-44407					
LCS 360-44407/2-A	Lab Control Sample	T	Water	3010A	
LCSD 360-44407/3-A	Lab Control Sample Duplicate	T	Water	3010A	
MB 360-44407/1-A	Method Blank	T	Water	3010A	
360-22588-1	OC-ISCO-3	T	Water	3010A	
360-22588-2	OC-ISCO-2	T	Water	3010A	
360-22588-3	OC-PZ16RRSW	T	Water	3010A	
360-22588-4	OC-PZ17RRSW	T	Water	3010A	
360-22588-5	OC-SD17	T	Water	3010A	
360-22588-6	OC-PZ18RSW	T	Water	3010A	
360-22588-7	OC-ISCO-1	T	Water	3010A	
Analysis Batch:360-44460					
LCS 360-44407/2-A	Lab Control Sample	T	Water	6010B	360-44407
LCSD 360-44407/3-A	Lab Control Sample Duplicate	T	Water	6010B	360-44407
MB 360-44407/1-A	Method Blank	T	Water	6010B	360-44407
360-22588-1	OC-ISCO-3	T	Water	6010B	360-44407
360-22588-2	OC-ISCO-2	T	Water	6010B	360-44407
360-22588-3	OC-PZ16RRSW	T	Water	6010B	360-44407
360-22588-4	OC-PZ17RRSW	T	Water	6010B	360-44407
360-22588-5	OC-SD17	T	Water	6010B	360-44407
360-22588-6	OC-PZ18RSW	T	Water	6010B	360-44407
360-22588-7	OC-ISCO-1	T	Water	6010B	360-44407
Analysis Batch:360-44463					
LCS 360-44463/1	Lab Control Sample	T	Water	6010B	
LCSD 360-44463/4	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-44463/2	Method Blank	T	Water	6010B	
360-22588-1	OC-ISCO-3	D	Water	6010B	
360-22588-2	OC-ISCO-2	D	Water	6010B	
360-22588-3	OC-PZ16RRSW	D	Water	6010B	
360-22588-4	OC-PZ17RRSW	D	Water	6010B	
360-22588-5	OC-SD17	D	Water	6010B	
360-22588-6	OC-PZ18RSW	D	Water	6010B	
360-22588-7	OC-ISCO-1	D	Water	6010B	

Report Basis

D = Dissolved

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-44423					
LCS 360-44423/1	Lab Control Sample	T	Water	SM 2510B	
MB 360-44423/2	Method Blank	T	Water	SM 2510B	
360-22588-1	OC-ISCO-3	T	Water	SM 2510B	
360-22588-2	OC-ISCO-2	T	Water	SM 2510B	
360-22588-3	OC-PZ16RRSW	T	Water	SM 2510B	
360-22588-4	OC-PZ17RRSW	T	Water	SM 2510B	
360-22588-5	OC-SD17	T	Water	SM 2510B	
360-22588-6	OC-PZ18RSW	T	Water	SM 2510B	
360-22588-7	OC-ISCO-1	T	Water	SM 2510B	
Analysis Batch:360-44452					
LCS 360-44452/2	Lab Control Sample	T	Water	300.0	
MB 360-44452/1	Method Blank	T	Water	300.0	
360-22588-1	OC-ISCO-3	T	Water	300.0	
360-22588-2	OC-ISCO-2	T	Water	300.0	
360-22588-3	OC-PZ16RRSW	T	Water	300.0	
Analysis Batch:360-44453					
LCS 360-44453/2	Lab Control Sample	T	Water	300.0	
MB 360-44453/1	Method Blank	T	Water	300.0	
360-22588-4	OC-PZ17RRSW	T	Water	300.0	
360-22588-4MS	Matrix Spike	T	Water	300.0	
360-22588-4MSD	Matrix Spike Duplicate	T	Water	300.0	
360-22588-5	OC-SD17	T	Water	300.0	
360-22588-6	OC-PZ18RSW	T	Water	300.0	
360-22588-7	OC-ISCO-1	T	Water	300.0	
Analysis Batch:360-44454					
LCS 360-44454/2	Lab Control Sample	T	Water	300.0	
MB 360-44454/1	Method Blank	T	Water	300.0	
360-22588-1	OC-ISCO-3	T	Water	300.0	
360-22588-2	OC-ISCO-2	T	Water	300.0	
360-22588-3	OC-PZ16RRSW	T	Water	300.0	
Analysis Batch:360-44455					
LCS 360-44455/2	Lab Control Sample	T	Water	300.0	
MB 360-44455/1	Method Blank	T	Water	300.0	
360-22588-4	OC-PZ17RRSW	T	Water	300.0	
360-22588-4MS	Matrix Spike	T	Water	300.0	
360-22588-4MSD	Matrix Spike Duplicate	T	Water	300.0	
360-22588-5	OC-SD17	T	Water	300.0	
360-22588-6	OC-PZ18RSW	T	Water	300.0	
360-22588-7	OC-ISCO-1	T	Water	300.0	

TestAmerica Westfield

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 360-44728					
LCS 360-44728/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-44728/1-A	Method Blank	T	Water	Distill/Ammonia	
360-22588-1	OC-ISCO-3	T	Water	Distill/Ammonia	
360-22588-2	OC-ISCO-2	T	Water	Distill/Ammonia	
360-22588-3	OC-PZ16RRSW	T	Water	Distill/Ammonia	
360-22588-4	OC-PZ17RRSW	T	Water	Distill/Ammonia	
360-22588-5	OC-SD17	T	Water	Distill/Ammonia	
360-22588-6	OC-PZ18RSW	T	Water	Distill/Ammonia	
360-22588-7	OC-ISCO-1	T	Water	Distill/Ammonia	
Analysis Batch:360-44744					
LCS 360-44728/2-A	Lab Control Sample	T	Water	L107-06-1B	360-44728
MB 360-44728/1-A	Method Blank	T	Water	L107-06-1B	360-44728
360-22588-1	OC-ISCO-3	T	Water	L107-06-1B	360-44728
360-22588-2	OC-ISCO-2	T	Water	L107-06-1B	360-44728
360-22588-3	OC-PZ16RRSW	T	Water	L107-06-1B	360-44728
360-22588-4	OC-PZ17RRSW	T	Water	L107-06-1B	360-44728
360-22588-5	OC-SD17	T	Water	L107-06-1B	360-44728
360-22588-6	OC-PZ18RSW	T	Water	L107-06-1B	360-44728
360-22588-7	OC-ISCO-1	T	Water	L107-06-1B	360-44728

Report Basis

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Method Blank - Batch: 360-44407

Method: 6010B
Preparation: 3010A

Lab Sample ID: MB 360-44407/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 1530
Date Prepared: 05/14/2009 0712

Analysis Batch: 360-44460
Prep Batch: 360-44407
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		2.2	100
Chromium	ND		0.17	5.0
Sodium	ND		65	2000

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-44407

Method: 6010B
Preparation: 3010A

LCS Lab Sample ID: LCS 360-44407/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 1533
Date Prepared: 05/14/2009 0712

Analysis Batch: 360-44460
Prep Batch: 360-44407
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

LCSD Lab Sample ID: LCSD 360-44407/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 1536
Date Prepared: 05/14/2009 0712

Analysis Batch: 360-44460
Prep Batch: 360-44407
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	101	100	80 - 120	0	20		
Chromium	102	102	80 - 120	0	20		
Sodium	98	98	80 - 120	1	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Method Blank - Batch: 360-44463

Method: 6010B
Preparation: N/A

Lab Sample ID: MB 360-44463/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 1731
Date Prepared: N/A

Analysis Batch: 360-44463
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	3.6	J	2.2	100
Chromium	ND		0.17	5.0
Sodium	ND		65	2000

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-44463

Method: 6010B
Preparation: N/A

LCS Lab Sample ID: LCS 360-44463/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 1729
Date Prepared: N/A

Analysis Batch: 360-44463
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-44463/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 1803
Date Prepared: N/A

Analysis Batch: 360-44463
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	99	99	80 - 120	0	20		
Chromium	99	98	80 - 120	1	20		
Sodium	98	98	80 - 120	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Method Blank - Batch: 360-44452

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-44452/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 1405
Date Prepared: N/A

Analysis Batch: 360-44452
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Nitrate as N	ND		0.050	0.050
Nitrite as N	ND		0.010	0.010

Lab Control Sample - Batch: 360-44452

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-44452/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 1420
Date Prepared: N/A

Analysis Batch: 360-44452
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	4.00	4.01	100	85 - 115	
Nitrite as N	4.00	4.10	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Method Blank - Batch: 360-44453

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-44453/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 2038
Date Prepared: N/A

Analysis Batch: 360-44453
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Nitrate as N	ND		0.050	0.050
Nitrite as N	ND		0.010	0.010

Lab Control Sample - Batch: 360-44453

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-44453/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 2053
Date Prepared: N/A

Analysis Batch: 360-44453
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	4.00	4.09	102	85 - 115	
Nitrite as N	4.00	4.09	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 360-44453

Method: 300.0
Preparation: N/A

MS Lab Sample ID: 360-22588-4
Client Matrix: Water
Dilution: 10
Date Analyzed: 05/13/2009 2138
Date Prepared: N/A

Analysis Batch: 360-44453
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-22588-4
Client Matrix: Water
Dilution: 10
Date Analyzed: 05/13/2009 2153
Date Prepared: N/A

Analysis Batch: 360-44453
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Nitrate as N	93	94	75 - 125	0	20		
Nitrite as N	102	102	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Method Blank - Batch: 360-44454

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-44454/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 1405
Date Prepared: N/A

Analysis Batch: 360-44454
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44454

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-44454/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 1420
Date Prepared: N/A

Analysis Batch: 360-44454
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	81.4	102	85 - 115	
Chloride	40.0	40.6	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Method Blank - Batch: 360-44455

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-44455/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 2038
Date Prepared: N/A

Analysis Batch: 360-44455
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44455

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-44455/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 2053
Date Prepared: N/A

Analysis Batch: 360-44455
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.1	103	85 - 115	
Chloride	40.0	40.8	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 360-44455

Method: 300.0
Preparation: N/A

MS Lab Sample ID: 360-22588-4
Client Matrix: Water
Dilution: 10
Date Analyzed: 05/13/2009 2138
Date Prepared: N/A

Analysis Batch: 360-44455
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-22588-4
Client Matrix: Water
Dilution: 10
Date Analyzed: 05/13/2009 2153
Date Prepared: N/A

Analysis Batch: 360-44455
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	105	104	75 - 125	0	20		
Chloride	100	99	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Method Blank - Batch: 360-44728

Lab Sample ID: MB 360-44728/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/22/2009 1345
Date Prepared: 05/22/2009 0850

Analysis Batch: 360-44744
Prep Batch: 360-44728
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-44728

Lab Sample ID: LCS 360-44728/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/22/2009 1346
Date Prepared: 05/22/2009 0850

Analysis Batch: 360-44744
Prep Batch: 360-44728
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.36	94	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22588-1

Method Blank - Batch: 360-44423

Method: SM 2510B
Preparation: N/A

Lab Sample ID: MB 360-44423/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 1243
Date Prepared: N/A

Analysis Batch: 360-44423
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Lab Control Sample - Batch: 360-44423

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-44423/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/13/2009 1221
Date Prepared: N/A

Analysis Batch: 360-44423
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1430	101	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Method Name	Description	State Accreditation				
		New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 Cl F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		P	P		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	P		
524.2	Trihalomethanes		P	P		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP	NP/P		

Not all organic compounds are accredited under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

This listing is subject to change based on the laboratories certification standing.

NP=Non Potable
P=Potable
SW=Solid Waste

Login Sample Receipt Check List

Client: Olin Corporation

Job Number: 360-22588-1

Login Number: 22588

List Source: TestAmerica Westfield

Creator: McDonald, Jerry

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	1.2C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Chain of Custody Form

[illegible]

LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Chris Riccarda 7/22/09
Sr. Review/Date Chris Riccarda 8/26/09
Lab Report # 360-22588-1
Project # 6107090016

specific conductance, ammonia, chloride, nitrate, nitrite, sulfate.

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
(IDs must be cross-referenced)

☒ Client Information: ☒ Name ☒ Address ☒ Client Contact

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Does the laboratory report include a completed Analytical Report Certification in the required format? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☐ Narrative includes an explanation of each discrepancy on the Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed? Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

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LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Yes ☒ No ☐ N/A ☐ Comments:

☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☒ Container type noted ☒ Condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Yes ☒ No ☐ N/A ☐ Comments:

☒ Ammonia, – 1 Liter polyethylene/H₂SO₄ to pH<2, cool to 4°C

Oil & Grease – 1 Liter glass/HCL or H₂SO₄ to pH<2, cool to 4°C

Alkalinity – 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand – 50 mL polyethylene/H₂SO₄ to pH<2, cool to 4°C

☒ Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C

Nitrate/nitrite - H₂SO₄ to pH<2, cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCl or H₂SO₄ to pH<2, cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H₂SO₄ to pH<2, cool to 4°C

☒ Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Were all samples delivered to the laboratory without breakage?

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

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STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?

<input checked="" type="checkbox"/> Field ID and Lab ID <input checked="" type="checkbox"/> Clean-up method <input type="checkbox"/> Matrix	<input checked="" type="checkbox"/> Date and time collected <input checked="" type="checkbox"/> Analysis method <input type="checkbox"/> Target analytes and concentrations	<input checked="" type="checkbox"/> Analyst Initials <input checked="" type="checkbox"/> Preparation method <input type="checkbox"/> Units (soils must be reported in dry weight)
	<input checked="" type="checkbox"/> Dilution Factor <input checked="" type="checkbox"/> Date of preparation/extraction/digestion clean-up and analysis, where applicable	<input checked="" type="checkbox"/> % moisture or solids <input checked="" type="checkbox"/> Reporting limits

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch?

☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

✓ 28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate		
Alkalinity = 14 days	Sulfide, TDS, TSS = 7 days	pH = analyze immediately
✓ Nitrite nitrogen as N = 48 hrs	Nitrate + Nitrite as N = 28 days	✓ Nitrate nitrogen as N = 48 hrs

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

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LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

3.2 Are the practical quantitation limits the same as those specified by the
☐ QAPP/IRSWP ☐ Lab?

Yes ☐ No ☒ N/A ☐ Comments:

Lab reported PQL for specific conductance of 1 umhos/cm. No carbon required.

Note: The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab. Other criteria may also apply.**

Ammonia* <input checked="" type="checkbox"/> = 0.1 mg/L	Alkalinity** <input type="checkbox"/> = 1 mg/L	Bicarbonate Alkalinity** <input type="checkbox"/> = 1 mg/L	Carbonate Alkalinity** <input type="checkbox"/> = 1 mg/L
Nitrate Nitrogen as N* <input checked="" type="checkbox"/> = .05 mg/L	Nitrite Nitrogen as N* <input checked="" type="checkbox"/> = .01 mg/L	Chloride* <input checked="" type="checkbox"/> = 1 mg/L	Hardness * <input type="checkbox"/> = 2 mg/L
Spec. Cond.** <input checked="" type="checkbox"/> 3 umhos/cm	Total Organic Carbon** <input type="checkbox"/> = 1 mg/L	Oil & Grease* <input type="checkbox"/> = 5.5 mg/L	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 2 mg/L
COD:* Low - 20 mg/L	COD* High - 50 mg/L <input type="checkbox"/>	TDS* <input type="checkbox"/> = 10 mg/L	TSS* <input type="checkbox"/> = 5 mg/L
pH* <input type="checkbox"/> < 2 to > 12	Phenolic - 0.01 mg/L		
Other parameter(list) _____	PQL = _____ <input type="checkbox"/> Source of PQL = _____		
Other parameter(list) _____	PQL = _____ <input type="checkbox"/> Source of PQL = _____		

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

Yes ☒ No ☐ N/A ☐ Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less?

Yes ☒ No ☐ N/A ☐ Comments:

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LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). Yes ☒ No ☐ N/A ☐ Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following: Yes ☐ No ☒ N/A ☐ Comments:

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times$ blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Yes ☐ No ☒ N/A ☐ Comments:

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LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

LCS Limits:

Alkalinity** <input type="checkbox"/> = 80-120%	Bicarbonate Alkalinity** <input type="checkbox"/> = 80-120%	Carbonate Alkalinity** <input type="checkbox"/> = 80-120%	Specific Conductivity * <input checked="" type="checkbox"/> = 80-120%
Total Organic Carbon** <input type="checkbox"/> = 80-120%	TDS** <input type="checkbox"/> = 80-120%	Oil & Grease* <input type="checkbox"/> = 80-120%	Ammonia Nitrogen as N* <input checked="" type="checkbox"/> = 80-120%
COD Low* <input type="checkbox"/> = 80-120%	COD High* <input type="checkbox"/> = 80-120%	Nitrate Nitrogen as N** <input checked="" type="checkbox"/> = 80-120%	Nitrite Nitrogen as N** <input checked="" type="checkbox"/> = 80-120%
Hardness* <input type="checkbox"/> = 80-120%	Chloride* <input checked="" type="checkbox"/> = 80-120%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 80-120%	pH* <input type="checkbox"/> = 98-102% TSS* NA

Other parameter(list) _____ %R = _____	Rec Limits= _____
Other parameter(list) _____ %R = _____	Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> <i>nitrate, nitrite, sulfate, and chloride MS/MSD analyses on sample</i>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> <i>OC-PZ 17 RPSW</i>	Comments: <i>The lab performed</i>
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Comments:
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Comments:
Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	Comments:

OLIN-WILMINGTON

LEVEL I DATA QUALITY EVALUATION

STANDARD OPERATING PROCEDURE AND CHECKLIST

WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

NOTE:	%R = SA	(SSR-SR) x 100%	Where:	SSR =	Spiked sample SR = Sample	result result
<u>MS/MSD Recovery Limits:</u>						
Alkalinity* = NA		Bicarbonate Alkalinity* = NA		Carbonate alkalinity* = NA	Ammonia* (LACHAT) <input checked="" type="checkbox"/> = 75-125%	
Chloride*(SM 4500 Cl) <input checked="" type="checkbox"/> = 75-125%		Specific Conductivity * = NA		Total Organic Carbon* = NA	TDS** = NA	
Oil & Grease* = NA		COD Low* <input type="checkbox"/> = 75-125%		COD High* <input type="checkbox"/> = 75-125%	Nitrate Nitrogen as N** <input checked="" type="checkbox"/> = 75-125%	
Nitrite Nitrogen as N** <input checked="" type="checkbox"/> = 75-125%		Hardness* <input type="checkbox"/> = 75-125%		Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 75-125%	pH* = NA	TSS* = NA
Other parameter(list)	% R =					

* = Laboratory Limits

*** = Olin QAPP Limits

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is $> 4X$ spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but $> 30\%$, qualify both positive results and non-detects (J). If the MS/MSD recovery is $< 30\%$ and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S - D}{(S + D)/2} \times 100\%$ Where S = MS result
D = MSD result

Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	Comments:

MS/MSD RPD Limits:

RPD ≤ 20

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes	No	N/A	Comments:
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3% Specific Conductivity * ☐ = 5% TSS** ☐ = 6% TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinse blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist. Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinsate blanks have positive results? Yes ☐ No ☐ N/A ☒ Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.
If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

NOTE: MADEP does not require the collection of rinsate blanks.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates. Yes ☐ No ☒ N/A ☐ Comments:

9.2 Were field duplicates collected per the required frequency? Yes ☐ No ☐ N/A ☒ Comments:

QAPP/IRSWP ☐ MADEP Option 1(1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 30\%$ for waters $\leq 50\%$ for soils? Calculate the RPD for results and attach to this review. Yes ☐ No ☐ N/A ☒ Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION: Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag** pages for entry in database.

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts; Project No. 6300-06-0010/41.1; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

Reviewer/Date John M. Hester 7/22/09
Sr. Review/Date Chns R1 card 8/26/09
Lab Report # 360-22588-1
Project # 610709

aluminum, chromium, sodium, total and dissolved

1.0 Laboratory Deliverable Requirements

1.1 **Laboratory Information:** Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:

Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☒ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☐ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 **Chain of Custody (COC)** copy present with all documentation completed Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of completed COC.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION I
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

1.5 Sample Receipt Information (*Cooler Receipt Form present?*):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☒ Container type noted ☐ sample condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage? Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: *Was each of the following requirements supplied in the laboratory report for each sample?* Yes ☒ No ☐ N/A ☐ Comments:

☒ Field ID and Lab ID ☒ Date and time collected ☒ Analyst Initials ☒ Dilution Factor ☒ % moisture or solids ☒ Reporting limits
☒ Clean-up method ☒ Analysis method ☒ Preparation method ☒ Date of preparation/extraction/digestion clean-up and analysis, where applicable
☒ Matrix ☒ Target analytes and concentrations ☒ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: *Was each of the following information supplied in the laboratory report for each sample batch?* Yes ☒ No ☐ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion 3005A or 3010A or 3020A
 Soil Digestion 3050B
 Metals 6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☐ SOW ☒ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

OLIN CORPORATION

LEVEL I DATA QUALITY EVALUATION – OPTION 1

STANDARD OPERATING PROCEDURE AND CHECKLIST

ICP METALS BY METHOD 6010B/200.7

ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG?

Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>	Comments:
------------	-------------------------------------	-----------	--------------------------	------------	--------------------------	------------------

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?

Yes	No	N/A	Comments:
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements?

Yes []	No []	N/A []	Comments:
	<input checked="" type="checkbox"/>		

NOTE: MADEP requires the method blank to be matrix matched and digested with the samples

4.4.4 Do any method blanks have positive results for metals? Qualify data according to the following: Aluminum (3.6 ug/L) is present in the method blank.

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	N/A	
			Comments:

OC-Isco-3, OC-Isco-2, OC-PZ Neasew, OC-PZ17 Raser, OC-SO17, OC-PZ6Paw, OC-Zisco-1 (~~300~~^{2274pm} -1 + some -7). Another limit was established at 5x the blank conc. (18y/L). The result for chemistry divided in sample OC-Isco-2 is less than the action limit ^{4 of 10} was calculated non-detected (nd) at the regulatory limit.

6010.doc

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LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5 \times$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source LCS is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP % Rec 80-120
Water	
Soil	within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-detect results are rejected (R).

Comments:

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LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked. Yes ☐ No ☒ N/A ☐ Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present? Yes ☐ No ☐ N/A ☒ Comments:

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule? Yes ☐ No ☐ N/A ☒ Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits? Yes ☐ No ☐ N/A ☒ Comments:

Sample Type	MADEP % Rec	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result
SA = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION I
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes ☐ No ☐ N/A ☒ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? Yes ☐ No ☒ N/A ☐ Comments:

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits? Yes ☐ No ☐ N/A ☒ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION I
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

MADEP Laboratory Duplicate Sample RPD Criteria:

	QAPP RPD
For aqueous results > 5× RL, RPD must be ± 20%	20
For aqueous results < 5× RL, RPD must be ≤ RL	20
For soil/sediment results > 5× RL, RPD must be ± 35%	20
For soil/sediment results < 5× RL, RPD must be ≤ 2× RL	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is < 5 × blank value, flag sample result non-detect “U” at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☐ No ☒ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION I
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

9.2 Were field duplicates collected per the required frequency?

Yes ☐ No ☐ N/A ☒ Comments:

SOW ☐ QAPP (1 per 10) ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 50\%$ for soils or waters? Calculate the RPD for all results and attach to this review. Yes ☐ No ☐ N/A ☒ Comments:

ACTION: RPD must be $\leq 50\%$ for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal. Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If results for both total and dissolved are $\geq 5x$ the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

The results for dissolved sodium in samples OC-ISCO-3, OC-ZSC0-2, OC-PZ1612SCW, OC-SD17, OC-PZ18P1W, and OC-ZSC0-1 are greater than ten percent more concentrated than the total sodium results. Total and dissolved sodium results in these samples were qualified estimated (J).

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☒ No ☐ N/A ☐ Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag** pages for entry in database.

REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

No Qvals
OK 8/26/09

ANALYTICAL REPORT

FILE COPY

Job Number: 360-22595-1

Job Description: Slurry Wall / Cap

For:

Olin Corporation

3855 North Ocoee Street

Suite 200

Cleveland, TN 37312-4441

Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:

Chetland

Joseph A. Chetland

Approved for release.
Joe Chimi
Report Production Representative
5/29/09 10:49 AM

Designee for

Becky C Mason

Project Manager II

becky.mason@testamericainc.com

05/29/2009

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory.

TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.

Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085

Tel (413) 572-4000 Fax (413) 572-3707 www.testamericainc.com



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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-22595-1
Project Location: Slurry Wall / Cap	MADEP RTN ¹ :
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-22595-(1-3)	
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:
MCP SW-846 Methods Used	8260B () 8151A () 8330 () 6010B (x) 7470A/1A () Other ()
	8270C () 8081A () VPH () 6020 () 9014M ² /9012 ()
	8082 () 8021B () EPH () 7000 S ³ () 7196A ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 5/29/09 10:39

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
53 Southampton Rd,
Westfield, MA 01085
Tel:(413)572-4000
Fax:(413)572-3707

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-22595-1
Project Location: Slurry Wall / Cap	MADEP RTN ¹ :
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-22595-(1-3)	
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:
MCP SW-846	8260B () 8151A () 8330 () 6010B () 7470A/1A () Other (x)
Methods Used	8270C () 8081A () VPH () 6020 () 9014M ² /9012 ()
As specified in MADEP	8082 () 8021B () EPH () 7000 S ³ () 7196A ()
Compendium of Analytical Methods. (check all that apply)	1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes N/A √	No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes N/A √	No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes N/A √	No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 5/29/09 10:39

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
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NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



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CASE NARRATIVE

Client: Olin Corporation

Project: Slurry Wall / Cap

Report Number: 360-22595-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 05/13/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.4°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

DISSOLVED METALS

Samples 360-22595-1 through 360-22595-3 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 05/18/2009.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

ANIONS

Samples 360-22595-1 through 360-22595-3 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 05/14/2009 and 05/15/2009.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-22595-1(10X), 360-22595-2(20X) and 360-22595-3(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentration.

AMMONIA

Samples 360-22595-1 through 360-22595-3 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 05/22/2009 and 05/28/2009.

All QC performance standards and recommendations for this specific method were achieved.

Sample 360-22595-2(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilution was due to high concentration.

SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Samples 360-22595-1 through 360-22595-3 were analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 05/18/2009.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22595-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22595-1	OC-GW-42S				
Sulfate		8.0	2.0	mg/L	300.0
Chloride		67	10	mg/L	300.0
Ammonia		0.37	0.10	mg/L	L107-06-1B
Specific Conductance		310	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		510	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
360-22595-2	OC-GW-201S				
Sulfate		1300	40	mg/L	300.0
Chloride		24	1.0	mg/L	300.0
Ammonia		72	1.0	mg/L	L107-06-1B
Specific Conductance		2500	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		14	5.0	ug/L	6010B
360-22595-3	OC-GW-35S				
Sulfate		400	20	mg/L	300.0
Chloride		6.6	1.0	mg/L	300.0
Ammonia		19	0.10	mg/L	L107-06-1B
Specific Conductance		1000	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		25	100	ug/L	6010B
Chromium		16	5.0	ug/L	6010B

METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-22595-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Dissolved Metals	TAL WFD	SW846 6010B	
Sample Filtration, Field	TAL WFD		FIELD_FLTRD
Chloride & Sulfate	TAL WFD	40CFR136A 300.0	
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B	
Distillation, Ammonia	TAL WFD		Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B	

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-22595-1

Method	Analyst	Analyst ID
SW846 6010B	Nasiatka, Ellen M	EMN
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-22595-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-22595-1	OC-GW-42S	Water	05/11/2009 1515	05/13/2009 0930
360-22595-2	OC-GW-201S	Water	05/12/2009 0950	05/13/2009 0930
360-22595-3	OC-GW-35S	Water	05/12/2009 1150	05/13/2009 0930

SAMPLE RESULTS

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-22595-1

Client Sample ID: OC-GW-42S
Lab Sample ID: 360-22595-1

Date Sampled: 05/11/2009 1515
Date Received: 05/13/2009 0930
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1152	
Aluminum	510	ug/L	2.2	100	1.0
Chromium	12	ug/L	0.17	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-22595-1

Client Sample ID: OC-GW-42S
Lab Sample ID: 360-22595-1

Date Sampled: 05/11/2009 1515
Date Received: 05/13/2009 0930
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Sulfate	8.0	mg/L	2.0	2.0	1.0
Method: 300.0 Chloride	67	mg/L	10	10	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	0.37	mg/L	0.10	0.10	1.0
Method: SM 2510B Specific Conductance	310	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-22595-1

Client Sample ID: OC-GW-201S
Lab Sample ID: 360-22595-2

Date Sampled: 05/12/2009 0950
Date Received: 05/13/2009 0930
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1210	
Aluminum	ND	ug/L	2.2	100	1.0
Chromium	14	ug/L	0.17	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-22595-1

Client Sample ID: OC-GW-201S
Lab Sample ID: 360-22595-2

Date Sampled: 05/12/2009 0950
Date Received: 05/13/2009 0930
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	24	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	1300	mg/L	40	40	20
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	72	mg/L	1.0	1.0	10
Method: SM 2510B Specific Conductance	2500	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-22595-1

Client Sample ID: OC-GW-35S
Lab Sample ID: 360-22595-3

Date Sampled: 05/12/2009 1150
Date Received: 05/13/2009 0930
Client Matrix: Water

Analyte		Result/Qualifier		Unit	MDL	RL	Dilution	
Method:	Dissolved-6010B	Date Analyzed:			05/18/2009	1213		
		Aluminum	25	J	ug/L	2.2	100	1.0
		Chromium	16		ug/L	0.17	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-22595-1

Client Sample ID: OC-GW-35S
Lab Sample ID: 360-22595-3

Date Sampled: 05/12/2009 1150
Date Received: 05/13/2009 0930
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	6.6	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	400	mg/L	20	20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	19	mg/L	0.10	0.10	1.0
Method: SM 2510B Specific Conductance	1000	umhos/cm	1.0	1.0	1.0

DATA REPORTING QUALIFIERS

Client: Olin Corporation

Job Number: 360-22595-1

Lab Section	Qualifier	Description
Metals	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:360-44553					
LCS 360-44553/13	Lab Control Sample	T	Water	6010B	
LCSD 360-44553/25	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-44553/14	Method Blank	T	Water	6010B	
360-22595-1	OC-GW-42S	D	Water	6010B	
360-22595-1DU	Duplicate	D	Water	6010B	
360-22595-1MS	Matrix Spike	D	Water	6010B	
360-22595-2	OC-GW-201S	D	Water	6010B	
360-22595-3	OC-GW-35S	D	Water	6010B	

Report Basis

D = Dissolved

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-44534					
LCS 360-44534/2	Lab Control Sample	T	Water	300.0	
MB 360-44534/1	Method Blank	T	Water	300.0	
360-22595-1	OC-GW-42S	T	Water	300.0	
Analysis Batch:360-44535					
LCS 360-44535/2	Lab Control Sample	T	Water	300.0	
MB 360-44535/1	Method Blank	T	Water	300.0	
360-22595-2	OC-GW-201S	T	Water	300.0	
360-22595-2MS	Matrix Spike	T	Water	300.0	
360-22595-2MSD	Matrix Spike Duplicate	T	Water	300.0	
360-22595-3	OC-GW-35S	T	Water	300.0	
Analysis Batch:360-44537					
LCS 360-44537/2	Lab Control Sample	T	Water	300.0	
MB 360-44537/1	Method Blank	T	Water	300.0	
360-22595-2	OC-GW-201S	T	Water	300.0	
Analysis Batch:360-44548					
LCS 360-44548/1	Lab Control Sample	T	Water	SM 2510B	
MB 360-44548/2	Method Blank	T	Water	SM 2510B	
360-22595-1	OC-GW-42S	T	Water	SM 2510B	
360-22595-1DU	Duplicate	T	Water	SM 2510B	
360-22595-2	OC-GW-201S	T	Water	SM 2510B	
360-22595-3	OC-GW-35S	T	Water	SM 2510B	
Prep Batch: 360-44728					
LCS 360-44728/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-44728/1-A	Method Blank	T	Water	Distill/Ammonia	
360-22595-1	OC-GW-42S	T	Water	Distill/Ammonia	
360-22595-2	OC-GW-201S	T	Water	Distill/Ammonia	
Analysis Batch:360-44744					
LCS 360-44728/2-A	Lab Control Sample	T	Water	L107-06-1B	360-44728
MB 360-44728/1-A	Method Blank	T	Water	L107-06-1B	360-44728
360-22595-1	OC-GW-42S	T	Water	L107-06-1B	360-44728
360-22595-2	OC-GW-201S	T	Water	L107-06-1B	360-44728
Prep Batch: 360-44909					
LCS 360-44909/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-44909/1-A	Method Blank	T	Water	Distill/Ammonia	
360-22595-3	OC-GW-35S	T	Water	Distill/Ammonia	

TestAmerica Westfield

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-44916					
LCS 360-44909/2-A	Lab Control Sample	T	Water	L107-06-1B	360-44909
MB 360-44909/1-A	Method Blank	T	Water	L107-06-1B	360-44909
360-22595-3	OC-GW-35S	T	Water	L107-06-1B	360-44909

Report Basis

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Method Blank - Batch: 360-44553

Method: 6010B
Preparation: N/A

Lab Sample ID: MB 360-44553/14
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1054
Date Prepared: N/A

Analysis Batch: 360-44553
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		2.2	100
Chromium	ND		0.17	5.0

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-44553

Method: 6010B
Preparation: N/A

LCS Lab Sample ID: LCS 360-44553/13
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1051
Date Prepared: N/A

Analysis Batch: 360-44553
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-44553/25
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1155
Date Prepared: N/A

Analysis Batch: 360-44553
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	100	100	80 - 120	0	20		
Chromium	100	99	80 - 120	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Matrix Spike - Batch: 360-44553

Method: 6010B
Preparation: N/A

Lab Sample ID: 360-22595-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1204
Date Prepared: N/A

Analysis Batch: 360-44553
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Aluminum	510	5000	5510	100	75 - 125	
Chromium	12	1000	996	98	75 - 125	

Duplicate - Batch: 360-44553

Method: 6010B
Preparation: N/A

Lab Sample ID: 360-22595-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1201
Date Prepared: N/A

Analysis Batch: 360-44553
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Aluminum	510	515	0	20	
Chromium	12	11.6	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Method Blank - Batch: 360-44534

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-44534/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 1520
Date Prepared: N/A

Analysis Batch: 360-44534
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44534

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-44534/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 1536
Date Prepared: N/A

Analysis Batch: 360-44534
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	81.6	102	85 - 115	
Chloride	40.0	40.6	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Method Blank - Batch: 360-44535

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-44535/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 2153
Date Prepared: N/A

Analysis Batch: 360-44535
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44535

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-44535/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/14/2009 2208
Date Prepared: N/A

Analysis Batch: 360-44535
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	81.7	102	85 - 115	
Chloride	40.0	40.9	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-44535

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-22595-2
Client Matrix: Water
Dilution: 10
Date Analyzed: 05/14/2009 2254
Date Prepared: N/A

Analysis Batch: 360-44535
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-22595-2
Client Matrix: Water
Dilution: 10
Date Analyzed: 05/14/2009 2309
Date Prepared: N/A

Analysis Batch: 360-44535
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Chloride	105	105	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Method Blank - Batch: 360-44537

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-44537/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/15/2009 1811
Date Prepared: N/A

Analysis Batch: 360-44537
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44537

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-44537/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/15/2009 1826
Date Prepared: N/A

Analysis Batch: 360-44537
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.1	103	85 - 115	
Chloride	40.0	41.0	103	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Method Blank - Batch: 360-44728

Lab Sample ID: MB 360-44728/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/22/2009 1345
Date Prepared: 05/22/2009 0850

Analysis Batch: 360-44744
Prep Batch: 360-44728
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-44728

Lab Sample ID: LCS 360-44728/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/22/2009 1346
Date Prepared: 05/22/2009 0850

Analysis Batch: 360-44744
Prep Batch: 360-44728
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.36	94	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Method Blank - Batch: 360-44909

Lab Sample ID: MB 360-44909/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/28/2009 1408
Date Prepared: 05/28/2009 1110

Analysis Batch: 360-44916
Prep Batch: 360-44909
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-44909

Lab Sample ID: LCS 360-44909/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/28/2009 1409
Date Prepared: 05/28/2009 1110

Analysis Batch: 360-44916
Prep Batch: 360-44909
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.71	97	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22595-1

Method Blank - Batch: 360-44548

Method: SM 2510B
Preparation: N/A

Lab Sample ID: MB 360-44548/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1103
Date Prepared: N/A

Analysis Batch: 360-44548
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Lab Control Sample - Batch: 360-44548

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-44548/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1101
Date Prepared: N/A

Analysis Batch: 360-44548
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1420	101	85 - 115	

Duplicate - Batch: 360-44548

Method: SM 2510B
Preparation: N/A

Lab Sample ID: 360-22595-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1106
Date Prepared: N/A

Analysis Batch: 360-44548
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	310	307	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Method Name	Description	State Accreditation				
		New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 Cl F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		P	P		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	P		
524.2	Trihalomethanes		P	P		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP	NP/P		

Not all organic compounds are accredited under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

This listing is subject to change based on the laboratories certification standing.

NP=Non Potable
P=Potable
SW=Solid Waste

Login Sample Receipt Check List

Client: Olin Corporation

Job Number: 360-22595-1

Login Number: 22595

List Source: TestAmerica Westfield

Creator: McDonald, Jerry

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	1.4C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date

Sr. Review/Date

Lab Report #

Project #

chloride, sulfate, ammonia

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
 Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Does the laboratory report include a completed Analytical Report Certification in the required format?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☐ Narrative includes an explanation of each discrepancy on the Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed?

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the original COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

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Yes ☒ No ☐ N/A ☐ Comments:

☒ Sample temperature confirmed: must be 1° - 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☒ Container type noted ☒ Condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Yes ☒ No ☐ N/A ☐ Comments:

☒ Ammonia, - 1 Liter polyethylene/H₂SO₄ to pH<2, cool to 4°C

Oil & Grease - 1 Liter glass/HCL or H₂SO₄ to pH<2, cool to 4°C

Alkalinity - 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand - 50 mL polyethylene/H₂SO₄ to pH<2, cool to 4°C

☒ Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C

Nitrate/nitrite - H₂SO₄ to pH<2, cool to 4°C

Organic Carbon - 500 mL amber glass bottle/HCL or H₂SO₄ to pH<2, cool to 4°C

Sulfide - 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H₂SO₄ to pH<2, cool to 4°C

☒ Specific conductance, TDS, TSS - 100 mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Were all samples delivered to the laboratory without breakage?

1.5.3 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

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1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?

<input checked="" type="checkbox"/> Field ID and Lab ID	<input checked="" type="checkbox"/> Date and time collected	<input checked="" type="checkbox"/> Analyst Initials	<input checked="" type="checkbox"/> Dilution Factor	<input checked="" type="checkbox"/> % moisture or solids	<input checked="" type="checkbox"/> Reporting limits
<input checked="" type="checkbox"/> Clean-up method	<input checked="" type="checkbox"/> Analysis method	<input checked="" type="checkbox"/> Preparation method	<input checked="" type="checkbox"/> Date of preparation/extraction/digestion	<input checked="" type="checkbox"/> clean-up and analysis, where applicable	
<input checked="" type="checkbox"/> Matrix	<input checked="" type="checkbox"/> Target analytes and concentrations		<input checked="" type="checkbox"/> Units (soils must be reported in dry weight)		

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch?

☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

✓ 28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days Sulfide, TDS, TSS = 7 days pH = analyze immediately Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

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3.2 Are the practical quantitation limits the same as those specified by the ☐ QAPP/IRSWP ☐ Lab? Yes ☐ No ☒ N/A ☐ Comments:

The lab reported an PQL for spec cond. (14000/cm) that is less than the stated project PQL. no further action required.

Ammonia* <input checked="" type="checkbox"/> = 0.1 mg/L	Alkalinity** <input type="checkbox"/> = 1 mg/L	Bicarbonate Alkalinity** <input type="checkbox"/> = 1 mg/L	Carbonate Alkalinity** <input type="checkbox"/> = 1 mg/L
Nitrate Nitrogen as N* <input type="checkbox"/> = .05 mg/L	Nitrite Nitrogen as N* <input type="checkbox"/> = .01 mg/L	Chloride* <input checked="" type="checkbox"/> = 1 mg/L	Hardness * <input type="checkbox"/> = 2 mg/L
Spec. Cond. ** <input checked="" type="checkbox"/> 3 umhos/cm	Total Organic Carbon** <input type="checkbox"/> = 1 mg/L	Oil & Grease* <input type="checkbox"/> = 5.5 mg/L	Sulfate (EPA 300.0)* <input type="checkbox"/> = 2 mg/L
COD:* Low - 20 mg/L	COD* High - 50 mg/L <input type="checkbox"/>	TDS* <input type="checkbox"/> = 10 mg/L	TSS* <input type="checkbox"/> = 5 mg/L
pH* <input type="checkbox"/> < 2 to > 12	Phenolic - 0.01 mg/L		
Other parameter(list) _____	PQL = _____ <input type="checkbox"/> Source of PQL = _____		
Other parameter(list) _____	PQL = _____ <input type="checkbox"/> Source of PQL = _____		

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks Yes ☒ No ☐ N/A ☐ Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? Yes ☒ No ☐ N/A ☐ Comments:

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ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). Yes ☒ No ☐ N/A ☐ Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following: Yes ☐ No ☒ N/A ☐ Comments:

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times$ blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Yes ☐ No ☒ N/A ☐ Comments:

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LCS Limits:

Alkalinity** <input type="checkbox"/> = 80-120%	Bicarbonate Alkalinity** <input type="checkbox"/> = 80-120%	Carbonate Alkalinity** <input type="checkbox"/> = 80-120%	Specific Conductivity * <input checked="" type="checkbox"/> = 80-120%
Total Organic Carbon** <input type="checkbox"/> = 80-120%	TDS** <input type="checkbox"/> = 80-120%	Oil & Grease* <input type="checkbox"/> = 80-120%	Ammonia Nitrogen as N* <input checked="" type="checkbox"/> = 80-120%
COD Low* <input type="checkbox"/> = 80-120%	COD High* <input type="checkbox"/> = 80-120%	Nitrate Nitrogen as N** <input type="checkbox"/> = 80-120%	Nitrite Nitrogen as N** <input type="checkbox"/> = 80-120%
Hardness* <input type="checkbox"/> = 80-120%	Chloride* <input checked="" type="checkbox"/> = 80-120%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 80-120%	pH* <input type="checkbox"/> = 98-102% TSS* NA

Other parameter(list) _____ %R = _____	Rec Limits= _____
Other parameter(list) _____ %R = _____	Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments: <i>The lab performed a chlorine MS/MSD analysis.</i>
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments:
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments:
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>	Comments:
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	Comments:

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NOTE: %R = $\frac{(SSR-SR)}{SA}$ x 100% Where: SSR = Spiked sample result SR = Sample result

SA = Spike added

MS/MSD Recovery Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHAT) <input type="checkbox"/> = 75-125%
Chloride*(SM 4500 Cl) <input checked="" type="checkbox"/> = 75-125%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA
Oil & Grease* = NA	COD Low* <input type="checkbox"/> = 75-125%	COD High* <input type="checkbox"/> = 75-125%	Nitrate Nitrogen as N** <input type="checkbox"/> = 75-125%
Nitrite Nitrogen as N** <input type="checkbox"/> = 75-125%	Hardness* <input type="checkbox"/> = 75-125%	Sulfate (EPA 300.0)* <input type="checkbox"/> = 75-125%	pH* = NA TSS* = NA
Other parameter(list) _____	% R = _____	<input type="checkbox"/> Rec Limits = _____	

* = Laboratory Limits

** = Olin QAPP Limits (MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
 2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S-D}{(S+D)/2}$ x 100% Where S = MS result D = MSD result

Yes ☐ No ☒ N/A ☐ Comments:

MS/MSD RPD Limits:

RPD ≤ 0

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes ☒ No ☐ N/A ☐ Comments:

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ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3%

Specific Conductivity * ☒ = 5%

TSS** ☐ = 6%

TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinse blanks collected? Prior to evaluating rinse blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐

No ☒

N/A ☐

Comments:

8.2 Do any rinse blanks have positive results?

Yes ☐

No ☐

N/A ☒

Comments:

ACTION: Evaluate rinse results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

NOTE: MADEP does not require the collection of *rinse blanks*.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☐

No ☒

N/A ☐

Comments:

9.2 Were field duplicates collected per the required frequency?

Yes ☐

No ☐

N/A ☒

Comments:

QAPP/IRSWP ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 30\%$ for waters $\leq 50\%$ for soils? Calculate the RPD for results and attach to this review.

Yes ☐

No ☐

N/A ☒

Comments:

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ACTION: Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Earnes Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1.; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

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ICP METALS BY METHOD 6010B/200.7

Reviewer/Date Chrys Riccardi 7/22/09
 Sr. Review/Date Chrys Riccardi 8/26/09
 Lab Report # 360-22595-1
 Project # 6107090016

Dissolved aluminum and chromium.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
☐ Client Information: ☐ Name ☐ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☐ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of completed COC.

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1.5 Sample Receipt Information (Cooler Receipt Form present?):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☒ sample condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

- ☒ Field ID and Lab ID ☒ Date and time collected ☒ Analyst Initials ☒ Dilution Factor ☒ % moisture or solids ☒ Reporting limits
- ☒ Clean-up method ☒ Analysis method ☒ Preparation method ☒ Date of preparation/extraction/digestion clean-up and analysis, where applicable
- ☒ Matrix ☒ Target analytes and concentrations ☒ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

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☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion	3005A or 3010A or 3020A
Soil Digestion	3050B
Metals	6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☐ SOW ☒ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

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ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

- 3.3 Are results present for each sample in the SDG? Yes ☒ No ☐ N/A ☐ Comments:
- ACTION:** If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data
- 3.4 If dilutions were required, were dilution factors reported? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

- 4.1 Is the Method Blank Summary present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call the laboratory for submission of missing data.

- 4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

- 4.3 Is the method blank less than the PQLs for all target elements? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: MADEP requires the method blank to be matrix matched and digested with the samples

- 4.4 Do any method blanks have positive results for metals? Qualify data according to the following: Yes ☐ No ☒ N/A ☐ Comments:

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If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5 \times$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source LCS is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP
Water	% Rec
Soil	80-120

within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-defect results are rejected (R).

Comments:

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6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

- 6.1** Were project-specific MS/MSDs collected? *analyzed* List project samples that were spiked. *(2) 7/18/19* Yes ☒ No ☐ N/A ☐ Comments: *The lab performed a MS analysis on sample OC-GW-425.*

ACTION: If no, contact senior chemist to see if any were specified.

- 6.2** Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

- 6.3** Were matrix spikes analyzed as indicated on the COC and project schedule?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

- 6.4** Are any metal spike recoveries outside of the QC limits?

Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP % Rec	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result
 SA = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

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ICP METALS BY METHOD 6010B/200.7

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?

Yes ☐ No ☐ N/A ☒ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$

Where: S = MS sample result
D = MSD sample result

An MSD analysis was not performed.

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits? Yes ☐ No ☒ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

<u>MADEP Laboratory Duplicate Sample RPD Criteria:</u>	<u>QAPP RPD</u>
<i>For aqueous results > 5× RL, RPD must be ± 20%</i>	20
<i>For aqueous results < 5× RL, RPD must be ≤ RL</i>	20
<i>For soil/sediment results > 5× RL, RPD must be ± 35%</i>	20
<i>For soil/sediment results < 5× RL, RPD must be ≤ 2× RL</i>	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is < 5 × blank value, flag sample result non-detect “U” at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☐ No ☒ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

9.2 Were field duplicates collected per the required frequency?

Yes ☐ No ☐ N/A ☒ Comments:

SOW ☐ QAPP (1 per 10) ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD \leq 50% for soils or waters? Calculate the RPD for all results and attach to this review. Yes ☐ No ☐ N/A ☒ Comments:

ACTION: RPD must be \leq 50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal. Yes ☐ No ☒ N/A ☐ Comments:

ACTION: If results for both total and dissolved are \geq 5x the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☐ No ☒ N/A ☐ Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

ANALYTICAL REPORT

Job Number: 360-22658-1
Job Description: Slurry Wall/Cap

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:
[Signature]

For:
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441
Attention: Mr. Steven Morrow

Joseph A. Chimi

Approved for release.
Joe Chimi
Report Production Representative
6/1/09 2:21 PM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
06/01/2009

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory.

TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.

Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085
Tel (413) 572-4000 Fax (413) 572-3707 www.testamericainc.com



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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-22658-1
Project Location: Slurry Wall/Cap	MADEP RTN ¹ :
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-22658-(1-18)	
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:
MCP SW-846 Methods Used	8260B () 8151A () 8330 () 6010B (x) 7470A/1A () Other ()
	8270C () 8081A () VPH () 6020 () 9014M ² /9012 ()
	8082 () 8021B () EPH () 7000 S ³ () 7196A ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 6/1/09 14:15

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



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53 Southampton Rd,
Westfield, MA 01085
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MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-22658-1
Project Location: Slurry Wall/Cap	MADEP RTN ¹ :
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-22658-(1-18)	
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:
MCP SW-846	8260B () 8151A () 8330 () 6010B () 7470A/1A () Other (x)
Methods Used	8270C () 8081A () VPH () 6020 () 9014M ² /9012 ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 () 8021B () EPH () 7000 S ³ () 7196A ()
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.	

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 6/1/09 14:15

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CAM VII A, Rev 3.2

April-04



MADEP MA014
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CASE NARRATIVE

Client: Olin Corporation

Project: Slurry Wall/Cap

Report Number: 360-22658-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 05/15/2009; the samples arrived in good condition, properly preserved and on ice. The temperatures of the coolers at receipt were 2.8 and 4.8°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

DISSOLVED METALS

Samples 360-22658-1 through 360-22658-18 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 05/18/2009.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

ANIONS

Samples 360-22658-1 through 360-22658-18 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 05/19/2009, 05/20/2009 and 05/22/2009.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-22658-2(10X), 360-22658-4 through 360-22658-6(10X), 360-22658-10(10X), 360-22658-11(10X), 360-22658-13(10X), 360-22658-15(10X), 360-22658-16(20X), 360-22658-16(50X), 360-22658-17(10X) and 360-22658-18(20X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentration.

AMMONIA

Samples 360-22658-1 through 360-22658-18 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 05/28/2009, 05/29/2009 and 06/01/2009.

All QC performance standards and recommendations for this specific method were achieved with the exception of:

Ammonia failed the MS/MSD recovery criteria high for the matrix spike duplicate of sample 360-22658-8MSD and exceeded the MS/MSD rpd limit. The associated LCS recovered within control limits. Refer to the QC report for details.

Samples 360-22658-2(10X), 360-22658-4(10X), 360-22658-5(10X), 360-22658-11(10X), 360-22658-13(10X), 360-22658-14(5X), 360-22658-15(20X), 360-22658-16(20X), 360-22658-17(10X) and 360-22658-18(20X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high concentration.

SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Samples 360-22658-1 through 360-22658-18 were analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 05/18/2009.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22658-1	OC-GW-10S				
Sulfate		41	2.0	mg/L	300.0
Chloride		5.2	1.0	mg/L	300.0
Ammonia		1.0	0.10	mg/L	L107-06-1B
Specific Conductance		110	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		3100	100	ug/L	6010B
360-22658-2	OC-GW-26				
Sulfate		160	20	mg/L	300.0
Chloride		180	10	mg/L	300.0
Ammonia		74	1.0	mg/L	L107-06-1B
Specific Conductance		1000	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		2.9 J	100	ug/L	6010B
Chromium		20	5.0	ug/L	6010B
360-22658-3	OC-GW-78S				
Sulfate		38	2.0	mg/L	300.0
Chloride		11	1.0	mg/L	300.0
Ammonia		11	0.10	mg/L	L107-06-1B
Specific Conductance		170	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		7.2 J	100	ug/L	6010B
Chromium		2.4 J	5.0	ug/L	6010B
360-22658-4	OC-GW-25				
Sulfate		120	20	mg/L	300.0
Chloride		37	10	mg/L	300.0
Ammonia		53	1.0	mg/L	L107-06-1B
Specific Conductance		570	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		3.7 J	5.0	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22658-5	OC-PZ-18R				
Sulfate		240	20	mg/L	300.0
Chloride		180	10	mg/L	300.0
Ammonia		62	1.0	mg/L	L107-06-1B
Specific Conductance		1200	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		3.6 J	100	ug/L	6010B
Chromium		18	5.0	ug/L	6010B
360-22658-6	OC-GW-39				
Sulfate		500	20	mg/L	300.0
Chloride		19	1.0	mg/L	300.0
Ammonia		0.15	0.10	mg/L	L107-06-1B
Specific Conductance		910	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		91 J	100	ug/L	6010B
360-22658-7	OC-GW-34SR				
Sulfate		7.1	2.0	mg/L	300.0
Chloride		1.1	1.0	mg/L	300.0
Ammonia		0.27	0.10	mg/L	L107-06-1B
Specific Conductance		65	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		0.52 J	5.0	ug/L	6010B
360-22658-8	OC-GW-34D				
Sulfate		37	2.0	mg/L	300.0
Chloride		14	1.0	mg/L	300.0
Ammonia		15 J	0.10	mg/L	L107-06-1B
Specific Conductance		210	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		4.0 J	100	ug/L	6010B
Chromium		13	5.0	ug/L	6010B


 7/28/09

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-22658-9	OC-GW-34D DUP				
Sulfate		38	2.0	mg/L	300.0
Chloride		15	1.0	mg/L	300.0
Ammonia		14	0.10	mg/L	L107-06-1B
Specific Conductance		210	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		4.7 J	100	ug/L	6010B
Chromium		13	5.0	ug/L	6010B
360-22658-10	OC-GW-55S				
Sulfate		1100	20	mg/L	300.0
Chloride		180	10	mg/L	300.0
Ammonia		15	0.10	mg/L	L107-06-1B
Specific Conductance		2800	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		470	100	ug/L	6010B
Chromium		1.8 J	5.0	ug/L	6010B
360-22658-11	OC-PZ-17RR				
Sulfate		550	20	mg/L	300.0
Chloride		18	1.0	mg/L	300.0
Ammonia		62	1.0	mg/L	L107-06-1B
Specific Conductance		1400	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		3.2 J	5.0	ug/L	6010B
360-22658-12	OC-GW-CA1				
Sulfate		39	2.0	mg/L	300.0
Chloride		2.1	1.0	mg/L	300.0
Ammonia		0.40	0.10	mg/L	L107-06-1B
Specific Conductance		390	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		6.0 J	100	ug/L	6010B
Chromium		0.92 J	5.0	ug/L	6010B


 7/28/09

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
360-22658-13	OC-GW-78S					
Sulfate		620		20	mg/L	300.0
Chloride		21		1.0	mg/L	300.0
Ammonia		71		1.0	mg/L	L107-06-1B
Specific Conductance		1400		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Aluminum		3.4	J	100	ug/L	6010B
Chromium		3.5	J	5.0	ug/L	6010B
360-22658-14	OC-GW-24					
Sulfate		68		2.0	mg/L	300.0
Chloride		6.3		1.0	mg/L	300.0
Ammonia		36		0.50	mg/L	L107-06-1B
Specific Conductance		350		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Aluminum		4.0	J	100	ug/L	6010B
360-22658-15	OC-PZ-16RR					
Sulfate		950		20	mg/L	300.0
Chloride		160		10	mg/L	300.0
Ammonia		190		2.0	mg/L	L107-06-1B
Specific Conductance		2600		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		7.4		5.0	ug/L	6010B
360-22658-16	OC-GW-202D					
Sulfate		2600		100	mg/L	300.0
Chloride		370		20	mg/L	300.0
Ammonia		360		2.0	mg/L	L107-06-1B
Specific Conductance		5000		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Aluminum		18000		100	ug/L	6010B
Chromium		1200		5.0	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-22658-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
360-22658-17	OC-GW-202S					
Sulfate		490		20	mg/L	300.0
Chloride		53		10	mg/L	300.0
Ammonia		120		1.0	mg/L	L107-06-1B
Specific Conductance		1300		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Aluminum		3.7	J	100	ug/L	6010B
Chromium		4.6	J	5.0	ug/L	6010B
360-22658-18	OC-GW-79S					
Sulfate		1300		40	mg/L	300.0
Chloride		190		20	mg/L	300.0
Ammonia		190		2.0	mg/L	L107-06-1B
Specific Conductance		3300		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Aluminum		18	J	100	ug/L	6010B
Chromium		6.6		5.0	ug/L	6010B

METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-22658-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Dissolved Metals	TAL WFD	SW846 6010B	
Sample Filtration, Field	TAL WFD		FIELD_FLTRD
Chloride & Sulfate	TAL WFD	40CFR136A 300.0	
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B	
Distillation, Ammonia	TAL WFD		Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B	

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-22658-1

Method	Analyst	Analyst ID
SW846 6010B	Nasiatka, Ellen M	EMN
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-22658-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-22658-1	OC-GW-10S	Ground Water	05/13/2009 0945	05/15/2009 1615
360-22658-2	OC-GW-26	Ground Water	05/13/2009 0935	05/15/2009 1615
360-22658-3	OC-GW-78S	Ground Water	05/13/2009 1105	05/15/2009 1615
360-22658-4	OC-GW-25	Ground Water	05/13/2009 1150	05/15/2009 1615
360-22658-5	OC-PZ-18R	Ground Water	05/13/2009 1305	05/15/2009 1615
360-22658-6	OC-GW-39	Ground Water	05/13/2009 1305	05/15/2009 1615
360-22658-7	OC-GW-34SR	Ground Water	05/13/2009 1430	05/15/2009 1615
360-22658-8	OC-GW-34D	Ground Water	05/13/2009 1435	05/15/2009 1615
360-22658-8MS	OC-GW-34D MS	Ground Water	05/13/2009 1435	05/15/2009 1615
360-22658-8MSD	OC-GW-34D MSD	Ground Water	05/13/2009 1435	05/15/2009 1615
360-22658-9	OC-GW-34D DUP	Ground Water	05/13/2009 1435	05/15/2009 1615
360-22658-10	OC-GW-55S	Ground Water	05/14/2009 0950	05/15/2009 1615
360-22658-11	OC-PZ-17RR	Ground Water	05/14/2009 1105	05/15/2009 1615
360-22658-12	OC-GW-CA1	Ground Water	05/14/2009 1235	05/15/2009 1615
360-22658-13	OC-GW-78S	Ground Water	05/14/2009 1255	05/15/2009 1615
360-22658-14	OC-GW-24	Ground Water	05/14/2009 1405	05/15/2009 1615
360-22658-15	OC-PZ-16RR	Ground Water	05/14/2009 1430	05/15/2009 1615
360-22658-16	OC-GW-202D	Ground Water	05/15/2009 0920	05/15/2009 1615
360-22658-17	OC-GW-202S	Ground Water	05/15/2009 0905	05/15/2009 1615
360-22658-18	OC-GW-79S	Ground Water	05/15/2009 1035	05/15/2009 1615

SAMPLE RESULTS

Mr. Steven Morrow
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3855 North Ocoee Street
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Job Number: 360-22658-1

Client Sample ID: OC-GW-10S
Lab Sample ID: 360-22658-1

Date Sampled: 05/13/2009 0945
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 05/18/2009 1227			
Aluminum	3100	ug/L	2.2	100	1.0
Chromium	ND	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-10S
Lab Sample ID: 360-22658-1

Date Sampled: 05/13/2009 0945
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	05/19/2009 1832	
Sulfate	41	mg/L	2.0	2.0	1.0
Chloride	5.2	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia			Date Analyzed:	05/28/2009 1415	
			Date Prepared:	05/28/2009 1110	
Ammonia	1.0	mg/L	0.10	0.10	1.0
Method: SM 2510B					
Specific Conductance	110	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-26
Lab Sample ID: 360-22658-2

Date Sampled: 05/13/2009 0935
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B						
	Date Analyzed:			05/18/2009 1236		
Aluminum	2.9	J	ug/L	2.2	100	1.0
Chromium	20		ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-26
Lab Sample ID: 360-22658-2

Date Sampled: 05/13/2009 0935
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Sulfate	160	mg/L	20	20	10
Chloride	180	mg/L	10	10	10
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	74	mg/L	1.0	1.0	10
Method: SM 2510B					
Specific Conductance	1000	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-78S
Lab Sample ID: 360-22658-3

Date Sampled: 05/13/2009 1105
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1238		
Aluminum	7.2	J	ug/L	2.2	100	1.0
Chromium	2.4	J	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-78S
Lab Sample ID: 360-22658-3

Date Sampled: 05/13/2009 1105
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	05/19/2009 1932		
Sulfate	38	mg/L	2.0	2.0	1.0
Chloride	11	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
		Date Analyzed:	05/28/2009 1419		
		Date Prepared:	05/28/2009 1110		
Ammonia	11	mg/L	0.10	0.10	1.0
Method: SM 2510B					
Specific Conductance	170	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-25
Lab Sample ID: 360-22658-4

Date Sampled: 05/13/2009 1150
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1241		
Aluminum	ND		ug/L	2.2	100	1.0
Chromium	3.7	J	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-25
Lab Sample ID: 360-22658-4

Date Sampled: 05/13/2009 1150
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Sulfate	120	mg/L	20	20	10
Chloride	37	mg/L	10	10	10
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	53	mg/L	1.0	1.0	10
Method: SM 2510B					
Specific Conductance	570	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-PZ-18R
Lab Sample ID: 360-22658-5

Date Sampled: 05/13/2009 1305
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B						
			Date Analyzed:	05/18/2009 1244		
Aluminum	3.6	J	ug/L	2.2	100	1.0
Chromium	18		ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-PZ-18R
Lab Sample ID: 360-22658-5

Date Sampled: 05/13/2009 1305
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	05/19/2009 2118	
Sulfate	240	mg/L	20	20	10
Chloride	180	mg/L	10	10	10
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
			Date Analyzed:	05/28/2009 1433	
			Date Prepared:	05/28/2009 1110	
Ammonia	62	mg/L	1.0	1.0	10
Method: SM 2510B					
			Date Analyzed:	05/18/2009 1117	
Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-39
Lab Sample ID: 360-22658-6

Date Sampled: 05/13/2009 1305
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B						
Aluminum	91	J	ug/L	2.2	100	1.0
Chromium	ND		ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-39
Lab Sample ID: 360-22658-6

Date Sampled: 05/13/2009 1305
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	19	mg/L	1.0	05/19/2009 2133 1.0	1.0
Method: 300.0 Sulfate	500	mg/L	20	05/19/2009 2148 20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	0.15	mg/L	0.10	05/28/2009 1422 05/28/2009 1110 0.10	1.0
Method: SM 2510B Specific Conductance	910	umhos/cm	1.0	05/18/2009 1118 1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-34SR
Lab Sample ID: 360-22658-7

Date Sampled: 05/13/2009 1430
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed: 05/18/2009 1250		
Aluminum	ND	ug/L	2.2	100	1.0
Chromium	0.52 J	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-34SR
Lab Sample ID: 360-22658-7

Date Sampled: 05/13/2009 1430
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	05/19/2009 2203	
Sulfate	7.1	mg/L	2.0	2.0	1.0
Chloride	1.1	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
			Date Analyzed:	05/28/2009 1423	
Prep Method: Distill/Ammonia			Date Prepared:	05/28/2009 1110	
Ammonia	0.27	mg/L	0.10	0.10	1.0
Method: SM 2510B					
Specific Conductance	65	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-34D
Lab Sample ID: 360-22658-8

Date Sampled: 05/13/2009 1435
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B						
			Date Analyzed:	05/18/2009 1215		
Aluminum	4.0	J	ug/L	2.2	100	1.0
Chromium	13		ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-34D
Lab Sample ID: 360-22658-8

Date Sampled: 05/13/2009 1435
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	05/20/2009 0004		
Sulfate	37	mg/L	2.0	2.0	1.0
Chloride	14	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
		Date Analyzed:	06/01/2009 1204		
Prep Method: Distill/Ammonia		Date Prepared:	06/01/2009 0857		
Ammonia	15 <i>5</i>	mg/L	0.10	0.10	1.0
Method: SM 2510B					
Specific Conductance	210	umhos/cm	1.0	1.0	1.0

J. M. Utter
7/20/09

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Job Number: 360-22658-1

Client Sample ID: OC-GW-34D DUP
Lab Sample ID: 360-22658-9

Date Sampled: 05/13/2009 1435
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1253	
Aluminum	4.7 J	ug/L	2.2	100	1.0
Chromium	13	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-34D DUP
Lab Sample ID: 360-22658-9

Date Sampled: 05/13/2009 1435
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0		Date Analyzed: 05/19/2009 2233			
Sulfate	38	mg/L	2.0	2.0	1.0
Chloride	15	mg/L	1.0	1.0	1.0
Method: L107-06-1B		Date Analyzed: 06/01/2009 1204			
Prep Method: Distill/Ammonia		Date Prepared: 06/01/2009 0857			
Ammonia	14 5	mg/L	0.10	0.10	1.0
Method: SM 2510B		Date Analyzed: 05/18/2009 1122			
Specific Conductance	210	umhos/cm	1.0	1.0	1.0

W. J. Miller
7/28/09

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Job Number: 360-22658-1

Client Sample ID: OC-GW-55S
Lab Sample ID: 360-22658-10

Date Sampled: 05/14/2009 0950
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1256	
Aluminum	470	ug/L	2.2	100	1.0
Chromium	1.8 J	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-55S
Lab Sample ID: 360-22658-10

Date Sampled: 05/14/2009 0950
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Sulfate	1100	mg/L	20	20	10
Chloride	180	mg/L	10	10	10
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	15	mg/L	0.10	0.10	1.0
Method: SM 2510B					
Specific Conductance	2800	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-PZ-17RR
Lab Sample ID: 360-22658-11

Date Sampled: 05/14/2009 1105
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1258		
Aluminum	ND		ug/L	2.2	100	1.0
Chromium	3.2	J	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-PZ-17RR
Lab Sample ID: 360-22658-11

Date Sampled: 05/14/2009 1105
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	18	mg/L	1.0	05/20/2009 0134 1.0	1.0
Method: 300.0 Sulfate	550	mg/L	20	05/20/2009 0150 20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	62	mg/L	1.0	05/29/2009 1559 05/29/2009 1410 1.0	10
Method: SM 2510B Specific Conductance	1400	umhos/cm	1.0	05/18/2009 1125 1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-CA1
Lab Sample ID: 360-22658-12

Date Sampled: 05/14/2009 1235
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1301		
Aluminum	6.0	J	ug/L	2.2	100	1.0
Chromium	0.92	J	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-CA1
Lab Sample ID: 360-22658-12

Date Sampled: 05/14/2009 1235
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	05/20/2009 0205		
Sulfate	39	mg/L	2.0	2.0	1.0
Chloride	2.1	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
		Date Analyzed:	05/29/2009 1550		
		Date Prepared:	05/29/2009 1410		
Ammonia	0.40	mg/L	0.10	0.10	1.0
Method: SM 2510B					
Specific Conductance	390	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-78S
Lab Sample ID: 360-22658-13

Date Sampled: 05/14/2009 1255
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1310		
Aluminum	3.4	J	ug/L	2.2	100	1.0
Chromium	3.5	J	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-78S
Lab Sample ID: 360-22658-13

Date Sampled: 05/14/2009 1255
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	21	mg/L	1.0	05/20/2009 0305 1.0	1.0
Method: 300.0 Sulfate	620	mg/L	20	05/20/2009 1730 20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	71	mg/L	1.0	05/29/2009 1600 05/29/2009 1410 1.0	10
Method: SM 2510B Specific Conductance	1400	umhos/cm	1.0	05/18/2009 1128 1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-24
Lab Sample ID: 360-22658-14

Date Sampled: 05/14/2009 1405
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B						
			Date Analyzed:		05/18/2009 1313	
Aluminum	4.0	J	ug/L	2.2	100	1.0
Chromium	ND		ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-24
Lab Sample ID: 360-22658-14

Date Sampled: 05/14/2009 1405
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Sulfate	68	mg/L	2.0	2.0	1.0
Chloride	6.3	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	36	mg/L	0.50	0.50	5.0
Method: SM 2510B					
Specific Conductance	350	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-PZ-16RR
Lab Sample ID: 360-22658-15

Date Sampled: 05/14/2009 1430
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 05/18/2009 1316			
Aluminum	ND	ug/L	2.2	100	1.0
Chromium	7.4	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-PZ-16RR
Lab Sample ID: 360-22658-15

Date Sampled: 05/14/2009 1430
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Sulfate	950	mg/L	20	20	10
Chloride	160	mg/L	10	10	10
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	190	mg/L	2.0	2.0	20
Method: SM 2510B					
Specific Conductance	2600	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
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Job Number: 360-22658-1

Client Sample ID: OC-GW-202D
Lab Sample ID: 360-22658-16

Date Sampled: 05/15/2009 0920
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 05/18/2009 1319			
Aluminum	18000	ug/L	2.2	100	1.0
Chromium	1200	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-202D
Lab Sample ID: 360-22658-16

Date Sampled: 05/15/2009 0920
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	370	mg/L	Date Analyzed: 05/20/2009 1800 20	20	20
Method: 300.0 Sulfate	2600	mg/L	Date Analyzed: 05/22/2009 0347 100	100	50
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	360	mg/L	Date Analyzed: 05/29/2009 1603 Date Prepared: 05/29/2009 1410 2.0	2.0	20
Method: SM 2510B Specific Conductance	5000	umhos/cm	Date Analyzed: 05/18/2009 1133 1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-202S
Lab Sample ID: 360-22658-17

Date Sampled: 05/15/2009 0905
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	05/18/2009 1321		
Aluminum	3.7	J	ug/L	2.2	100	1.0
Chromium	4.6	J	ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-202S
Lab Sample ID: 360-22658-17

Date Sampled: 05/15/2009 0905
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Sulfate	490	mg/L	20	20	10
Chloride	53	mg/L	10	10	10
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	120	mg/L	1.0	1.0	10
Method: SM 2510B					
Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-79S
Lab Sample ID: 360-22658-18

Date Sampled: 05/15/2009 1035
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B						
			Date Analyzed:		05/18/2009 1324	
Aluminum	18	J	ug/L	2.2	100	1.0
Chromium	6.6		ug/L	0.17	5.0	1.0

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Job Number: 360-22658-1

Client Sample ID: OC-GW-79S
Lab Sample ID: 360-22658-18

Date Sampled: 05/15/2009 1035
Date Received: 05/15/2009 1615
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
Sulfate	1300	mg/L	40	40	20
Chloride	190	mg/L	20	20	20
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	190	mg/L	2.0	2.0	20
Method: SM 2510B					
Specific Conductance	3300	umhos/cm	1.0	1.0	1.0

DATA REPORTING QUALIFIERS

Client: Olin Corporation

Job Number: 360-22658-1

Lab Section	Qualifier	Description
Metals	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry	F	MS or MSD exceeds the control limits
	F	RPD of the MS and MSD exceeds the control limits

QUALITY CONTROL RESULTS

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:360-44554					
LCS 360-44554/1	Lab Control Sample	T	Water	6010B	
LCSD 360-44554/8	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-44554/2	Method Blank	T	Water	6010B	
360-22658-1	OC-GW-10S	D	Water	6010B	
360-22658-2	OC-GW-26	D	Water	6010B	
360-22658-3	OC-GW-78S	D	Water	6010B	
360-22658-4	OC-GW-25	D	Water	6010B	
360-22658-5	OC-PZ-18R	D	Water	6010B	
360-22658-6	OC-GW-39	D	Water	6010B	
360-22658-7	OC-GW-34SR	D	Water	6010B	
360-22658-8	OC-GW-34D	D	Water	6010B	
360-22658-8MS	Matrix Spike	D	Water	6010B	
360-22658-8MSD	Matrix Spike Duplicate	D	Water	6010B	
360-22658-9	OC-GW-34D DUP	D	Water	6010B	
360-22658-10	OC-GW-55S	D	Water	6010B	
360-22658-11	OC-PZ-17RR	D	Water	6010B	
360-22658-12	OC-GW-CA1	D	Water	6010B	
360-22658-13	OC-GW-78S	D	Water	6010B	
360-22658-14	OC-GW-24	D	Water	6010B	
360-22658-15	OC-PZ-16RR	D	Water	6010B	
360-22658-16	OC-GW-202D	D	Water	6010B	
360-22658-17	OC-GW-202S	D	Water	6010B	
360-22658-18	OC-GW-79S	D	Water	6010B	

Report Basis

D = Dissolved

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-44548					
LCS 360-44548/1	Lab Control Sample	T	Water	SM 2510B	
LCS 360-44548/25	Lab Control Sample	T	Water	SM 2510B	
MB 360-44548/2	Method Blank	T	Water	SM 2510B	
MB 360-44548/24	Method Blank	T	Water	SM 2510B	
360-22658-1	OC-GW-10S	T	Water	SM 2510B	
360-22658-2	OC-GW-26	T	Water	SM 2510B	
360-22658-3	OC-GW-78S	T	Water	SM 2510B	
360-22658-4	OC-GW-25	T	Water	SM 2510B	
360-22658-5	OC-PZ-18R	T	Water	SM 2510B	
360-22658-6	OC-GW-39	T	Water	SM 2510B	
360-22658-7	OC-GW-34SR	T	Water	SM 2510B	
360-22658-8	OC-GW-34D	T	Water	SM 2510B	
360-22658-9	OC-GW-34D DUP	T	Water	SM 2510B	
360-22658-10	OC-GW-55S	T	Water	SM 2510B	
360-22658-11	OC-PZ-17RR	T	Water	SM 2510B	
360-22658-12	OC-GW-CA1	T	Water	SM 2510B	
360-22658-13	OC-GW-78S	T	Water	SM 2510B	
360-22658-14	OC-GW-24	T	Water	SM 2510B	
360-22658-15	OC-PZ-16RR	T	Water	SM 2510B	
360-22658-16	OC-GW-202D	T	Water	SM 2510B	
360-22658-17	OC-GW-202S	T	Water	SM 2510B	
360-22658-18	OC-GW-79S	T	Water	SM 2510B	
360-22658-18DU	Duplicate	T	Water	SM 2510B	
Analysis Batch:360-44617					
LCS 360-44617/2	Lab Control Sample	T	Water	300.0	
MB 360-44617/1	Method Blank	T	Water	300.0	
360-22658-1	OC-GW-10S	T	Water	300.0	
360-22658-2	OC-GW-26	T	Water	300.0	
360-22658-3	OC-GW-78S	T	Water	300.0	
360-22658-4	OC-GW-25	T	Water	300.0	
360-22658-5	OC-PZ-18R	T	Water	300.0	
360-22658-6	OC-GW-39	T	Water	300.0	
360-22658-7	OC-GW-34SR	T	Water	300.0	
360-22658-9	OC-GW-34D DUP	T	Water	300.0	

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-44619					
LCS 360-44619/2	Lab Control Sample	T	Water	300.0	
MB 360-44619/1	Method Blank	T	Water	300.0	
360-22658-8	OC-GW-34D	T	Water	300.0	
360-22658-8MS	Matrix Spike	T	Water	300.0	
360-22658-8MSD	Matrix Spike Duplicate	T	Water	300.0	
360-22658-10	OC-GW-55S	T	Water	300.0	
360-22658-11	OC-PZ-17RR	T	Water	300.0	
360-22658-12	OC-GW-CA1	T	Water	300.0	
360-22658-13	OC-GW-78S	T	Water	300.0	
360-22658-14	OC-GW-24	T	Water	300.0	
Prep Batch: 360-44909					
LCS 360-44909/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-44909/1-A	Method Blank	T	Water	Distill/Ammonia	
360-22658-1	OC-GW-10S	T	Water	Distill/Ammonia	
360-22658-2	OC-GW-26	T	Water	Distill/Ammonia	
360-22658-3	OC-GW-78S	T	Water	Distill/Ammonia	
360-22658-4	OC-GW-25	T	Water	Distill/Ammonia	
360-22658-5	OC-PZ-18R	T	Water	Distill/Ammonia	
360-22658-6	OC-GW-39	T	Water	Distill/Ammonia	
360-22658-7	OC-GW-34SR	T	Water	Distill/Ammonia	
360-22658-8MSMS	Matrix Spike	T	Water	Distill/Ammonia	
360-22658-8MSDMSD	Matrix Spike Duplicate	T	Water	Distill/Ammonia	
360-22658-10	OC-GW-55S	T	Water	Distill/Ammonia	
Analysis Batch:360-44916					
LCS 360-44909/2-A	Lab Control Sample	T	Water	L107-06-1B	360-44909
MB 360-44909/1-A	Method Blank	T	Water	L107-06-1B	360-44909
360-22658-1	OC-GW-10S	T	Water	L107-06-1B	360-44909
360-22658-2	OC-GW-26	T	Water	L107-06-1B	360-44909
360-22658-3	OC-GW-78S	T	Water	L107-06-1B	360-44909
360-22658-4	OC-GW-25	T	Water	L107-06-1B	360-44909
360-22658-5	OC-PZ-18R	T	Water	L107-06-1B	360-44909
360-22658-6	OC-GW-39	T	Water	L107-06-1B	360-44909
360-22658-7	OC-GW-34SR	T	Water	L107-06-1B	360-44909
360-22658-8MSMS	Matrix Spike	T	Water	L107-06-1B	360-44909
360-22658-8MSDMSD	Matrix Spike Duplicate	T	Water	L107-06-1B	360-44909
360-22658-10	OC-GW-55S	T	Water	L107-06-1B	360-44909

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Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-44926					
LCS 360-44926/2	Lab Control Sample	T	Water	300.0	
MB 360-44926/1	Method Blank	T	Water	300.0	
360-22658-13	OC-GW-78S	T	Water	300.0	
360-22658-15	OC-PZ-16RR	T	Water	300.0	
360-22658-15MS	Matrix Spike	T	Water	300.0	
360-22658-15MSD	Matrix Spike Duplicate	T	Water	300.0	
360-22658-16	OC-GW-202D	T	Water	300.0	
360-22658-17	OC-GW-202S	T	Water	300.0	
360-22658-18	OC-GW-79S	T	Water	300.0	
Analysis Batch:360-44933					
LCS 360-44933/2	Lab Control Sample	T	Water	300.0	
MB 360-44933/1	Method Blank	T	Water	300.0	
360-22658-16	OC-GW-202D	T	Water	300.0	
Prep Batch: 360-44990					
LCS 360-44990/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-44990/1-A	Method Blank	T	Water	Distill/Ammonia	
360-22658-11	OC-PZ-17RR	T	Water	Distill/Ammonia	
360-22658-12	OC-GW-CA1	T	Water	Distill/Ammonia	
360-22658-13	OC-GW-78S	T	Water	Distill/Ammonia	
360-22658-14	OC-GW-24	T	Water	Distill/Ammonia	
360-22658-15	OC-PZ-16RR	T	Water	Distill/Ammonia	
360-22658-16	OC-GW-202D	T	Water	Distill/Ammonia	
360-22658-17	OC-GW-202S	T	Water	Distill/Ammonia	
360-22658-18	OC-GW-79S	T	Water	Distill/Ammonia	
Analysis Batch:360-44996					
LCS 360-44990/2-A	Lab Control Sample	T	Water	L107-06-1B	360-44990
MB 360-44990/1-A	Method Blank	T	Water	L107-06-1B	360-44990
360-22658-11	OC-PZ-17RR	T	Water	L107-06-1B	360-44990
360-22658-12	OC-GW-CA1	T	Water	L107-06-1B	360-44990
360-22658-13	OC-GW-78S	T	Water	L107-06-1B	360-44990
360-22658-14	OC-GW-24	T	Water	L107-06-1B	360-44990
360-22658-15	OC-PZ-16RR	T	Water	L107-06-1B	360-44990
360-22658-16	OC-GW-202D	T	Water	L107-06-1B	360-44990
360-22658-17	OC-GW-202S	T	Water	L107-06-1B	360-44990
360-22658-18	OC-GW-79S	T	Water	L107-06-1B	360-44990
Prep Batch: 360-45018					
LCS 360-45018/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-45018/1-A	Method Blank	T	Water	Distill/Ammonia	
360-22658-8	OC-GW-34D	T	Water	Distill/Ammonia	
360-22658-9	OC-GW-34D DUP	T	Water	Distill/Ammonia	

TestAmerica Westfield

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-45027					
LCS 360-45018/2-A	Lab Control Sample	T	Water	L107-06-1B	360-45018
MB 360-45018/1-A	Method Blank	T	Water	L107-06-1B	360-45018
360-22658-8	OC-GW-34D	T	Water	L107-06-1B	360-45018
360-22658-9	OC-GW-34D DUP	T	Water	L107-06-1B	360-45018

Report Basis

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-44554

Method: 6010B
Preparation: N/A

Lab Sample ID: MB 360-44554/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1158
Date Prepared: N/A

Analysis Batch: 360-44554
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		2.2	100
Chromium	ND		0.17	5.0

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-44554

Method: 6010B
Preparation: N/A

LCS Lab Sample ID: LCS 360-44554/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1155
Date Prepared: N/A

Analysis Batch: 360-44554
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-44554/8
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1230
Date Prepared: N/A

Analysis Batch: 360-44554
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	100	94	80 - 120	6	20		
Chromium	99	96	80 - 120	3	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 360-44554

Method: 6010B
Preparation: N/A

MS Lab Sample ID: 360-22658-8
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1218
Date Prepared: N/A

Analysis Batch: 360-44554
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-22658-8
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1221
Date Prepared: N/A

Analysis Batch: 360-44554
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aluminum	97	98	75 - 125	1	20		
Chromium	98	99	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-44617

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-44617/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/19/2009 1701
Date Prepared: N/A

Analysis Batch: 360-44617
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44617

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-44617/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/19/2009 1716
Date Prepared: N/A

Analysis Batch: 360-44617
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.7	103	85 - 115	
Chloride	40.0	40.8	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-44619

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-44619/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/19/2009 2334
Date Prepared: N/A

Analysis Batch: 360-44619
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44619

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-44619/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/19/2009 2349
Date Prepared: N/A

Analysis Batch: 360-44619
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	83.1	104	85 - 115	
Chloride	40.0	41.0	103	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 360-44619

Method: 300.0
Preparation: N/A

MS Lab Sample ID: 360-22658-8
Client Matrix: Water
Dilution: 10
Date Analyzed: 05/20/2009 0034
Date Prepared: N/A

Analysis Batch: 360-44619
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-22658-8
Client Matrix: Water
Dilution: 10
Date Analyzed: 05/20/2009 0049
Date Prepared: N/A

Analysis Batch: 360-44619
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	103	102	75 - 125	1	20		
Chloride	106	105	75 - 125	1	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-44926

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-44926/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/20/2009 1559
Date Prepared: N/A

Analysis Batch: 360-44926
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44926

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-44926/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/20/2009 1614
Date Prepared: N/A

Analysis Batch: 360-44926
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.5	103	85 - 115	
Chloride	40.0	41.1	103	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 360-44926

Method: 300.0
Preparation: N/A

MS Lab Sample ID: 360-22658-15
Client Matrix: Water
Dilution: 20
Date Analyzed: 05/20/2009 1659
Date Prepared: N/A

Analysis Batch: 360-44926
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-22658-15
Client Matrix: Water
Dilution: 20
Date Analyzed: 05/20/2009 1715
Date Prepared: N/A

Analysis Batch: 360-44926
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	109	108	75 - 125	0	20		
Chloride	107	107	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-44933

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-44933/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/21/2009 2245
Date Prepared: N/A

Analysis Batch: 360-44933
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-44933

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-44933/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/21/2009 2300
Date Prepared: N/A

Analysis Batch: 360-44933
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.8	104	85 - 115	
Chloride	40.0	41.2	103	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-44909

Lab Sample ID: MB 360-44909/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/28/2009 1408
Date Prepared: 05/28/2009 1110

Analysis Batch: 360-44916
Prep Batch: 360-44909
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-44909

Lab Sample ID: LCS 360-44909/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/28/2009 1409
Date Prepared: 05/28/2009 1110

Analysis Batch: 360-44916
Prep Batch: 360-44909
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.71	97	85 - 115	

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 360-44909

Method: L107-06-1B Preparation: Distill/Ammonia

MS Lab Sample ID: 360-22658-8MS
Client Matrix: Water
Dilution: 5.0
Date Analyzed: 05/28/2009 1434
Date Prepared: 05/28/2009 1110

Analysis Batch: 360-44916
Prep Batch: 360-44909

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 360-22658-8MSD
Client Matrix: Water
Dilution: 5.0
Date Analyzed: 05/28/2009 1435
Date Prepared: 05/28/2009 1110

Analysis Batch: 360-44916
Prep Batch: 360-44909

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Ammonia	91	160	75 - 125	25	20		F

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-44990

Lab Sample ID: MB 360-44990/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/29/2009 1544
Date Prepared: 05/29/2009 1410

Analysis Batch: 360-44996
Prep Batch: 360-44990
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-44990

Lab Sample ID: LCS 360-44990/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/29/2009 1545
Date Prepared: 05/29/2009 1410

Analysis Batch: 360-44996
Prep Batch: 360-44990
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	10.4	104	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-45018

Lab Sample ID: MB 360-45018/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/01/2009 1108
Date Prepared: 06/01/2009 0857

Analysis Batch: 360-45027
Prep Batch: 360-45018
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-45018

Lab Sample ID: LCS 360-45018/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 06/01/2009 1109
Date Prepared: 06/01/2009 0857

Analysis Batch: 360-45027
Prep Batch: 360-45018
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.41	94	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Method Blank - Batch: 360-44548

Lab Sample ID: MB 360-44548/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1103
Date Prepared: N/A

Analysis Batch: 360-44548
Prep Batch: N/A
Units: umhos/cm

Method: SM 2510B Preparation: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Method Blank - Batch: 360-44548

Lab Sample ID: MB 360-44548/24
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1137
Date Prepared: N/A

Analysis Batch: 360-44548
Prep Batch: N/A
Units: umhos/cm

Method: SM 2510B Preparation: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-22658-1

Lab Control Sample - Batch: 360-44548

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-44548/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1101
Date Prepared: N/A

Analysis Batch: 360-44548
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1420	101	85 - 115	

Lab Control Sample - Batch: 360-44548

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-44548/25
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1138
Date Prepared: N/A

Analysis Batch: 360-44548
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1390	99	85 - 115	

Duplicate - Batch: 360-44548

Method: SM 2510B
Preparation: N/A

Lab Sample ID: 360-22658-18
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 05/18/2009 1141
Date Prepared: N/A

Analysis Batch: 360-44548
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	3300	3320	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Method Name	Description	State Accreditation				
		New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 Cl F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		P	P		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	P		
524.2	Trihalomethanes		P	P		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP/P	NP	NP/P		

Not all organic compounds are accredited under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

This listing is subject to change based on the laboratories certification standing.

NP=Non Potable
P=Potable
SW=Solid Waste

Login Sample Receipt Check List

Client: Olin Corporation

Job Number: 360-22658-1

Login Number: 22658

List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	2.8 C / 4.8 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica Laboratories, Inc.

Chain of Custody Form

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

●53 Southampton Road
Westfield, MA 01085
(P) 413-572-4000
(F) 413-572-3707

●149 Rangeway Road
N. Billerica, MA 01862
(P) 978-667-1400
(F) 978-667-7871

Client: <u>Olin Chemical/MACTEC</u>		Project #: <u>G1007090016</u>		Job#	Quote#	PO#																										
Address: <u>51 Eames Street</u> <u>Wilmington, MA 01887</u>		Project Manager: <u>Peter Thompson</u>		Shaded areas for office use Analysis Requested Check analysis and specify method and analytes in comments section. For example: 500-series for drinking water 600-series for waste water 8000-series for haz/solid waste Use comments section to further define.																												
Phone: Fax:		Work ID: <u>PCMR Slurry wall/Cap</u>																														
Requested Turn Around Time		Contact: David Chapman		Comments (Special Instructions)																												
Regulatory Classification / Special Report Format																																
NPDES _____ Drinking Water _____ DEP Form(s) _____ RCRA _____ MCP GW1/S1 _____ MWRA Smart Rpt _____ Other _____ MCP QA/QC Rpt <u>XX</u>				MCP case narrative																												
Sample Type Codes WW-Wastewater DW-Drinking water SW-Surfacewater LW-Labwater GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other																																
Sample ID	Sample Type	Sampler's Initials	Date Time Collected	Grab	Comp.	# Containers	Plastic(P) or Glass(G)	Preservative												Nitrate, Nitrite	Groundwater metals	Surfacewater metals	Sediment: Al/Cr/Fe	Other	Other	Other	Other	Other	Other			
								NaHSO4/MeOH	HNO3 to pH <2	H2SO4 to pH <2	HCl to pH <2	NaOH to pH >12	NAOH/ZNAC	None / 4° C	Ammonia-Nitrogen	Chloride, Sulfate	Specific Conductivity															
QC - GW - 10S	GW	MAM	5-13-09 09:45	X		3	P		J	I																						Dissolved metals are field filtered.
OC - GW - 2G	GW	DLC	5-13-09 09:35	X		3	P		J	I																						Groundwater Metals: Dissolved Al/Cr
OC - GW - 78S	GW	DLC	5-13-09 01:05	X		3	P		J	I																						Surfacewater Metals: Dissolved/Total Al/Cr/Na
OC - GW - 2S	GW	MAM	5-13-09 11:50	X		3	P		J	I																						
OC - PZ - 18R	GW	MAM	5-13-09 13:05	X		3	P		J	I																						
OC - GW - 39	GW	DLC	5-13-09 13:05	X		3	P		J	I																						
OC - GW - 34SR	GW	MAM	5-13-09 14:30	X		3	P		J	I																						
OC - GW - 34D	GW	DLC	5-13-09 14:35	X		3	P		J	I																						
OC - GW - 34DDUP	GW	DLC	5-13-09 14:35	X		3	P		J	I																						
OC - GW - 34MS	GW	DLC	5-13-09 14:35	X		3	P		J	I																						
Sampled by (print): <u>David Chapman / Mark Maggione</u>				Signature: <u>[Signature]</u>				Cooler? <input checked="" type="checkbox"/> N Samples Iced? <input checked="" type="checkbox"/> N Temp @ receipt: <u>2.8°C / 4.8°C</u> Preservation/pH checked By: <u>KAC</u> Date: <u>5/15/09</u>																								
Relinquished by: <u>David Chapman</u> Date: <u>5-15-09</u> Time: <u>14:00</u>				Received by: <u>Jerry Oak</u> Date: <u>5/15/09</u> Time: <u>1245</u>																												
Relinquished by: <u>Jerry Oak</u> Date: <u>5/15/09</u> Time: <u>1615</u>				Received by: <u>[Signature]</u> Date: <u>5/15/09</u> Time: <u>1615</u>																												
Method of shipment:				TestAmerica-Westfield																												

TestAmerica Laboratories, Inc.

Chain of Custody Form

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THE LEADER IN ENVIRONMENTAL TESTING

•53 Southampton Road
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(F) 413-572-3707

•149 Rangeway Road
N. Billerica, MA 01862
(P) 978-667-1400
(F) 978-667-7871

360 22658

Client: <u>Olin Chemical/MACTEC</u>			Project #: <u>61007090015</u>			Job#		Quote#		PO#																																																																																																																																																																																																																																																																																																																																																																																	
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10 Business Day (Std) <u>XX</u> Rush TAT Requested: 15 Business Day 24 hrs 72 hrs Other 48 hrs 5 Day			NPDES Drinking Water DEP Form(s) RCRA MCP GW1/S1 MWRA Smart Rpt Other MCP QA/QC Rpt <u>XX</u>																																																																																																																																																																																																																																																																																																																																																																																								
Sample Type Codes WW-Wastewater DW-Drinking water SW-Surfacewater LW-Labwater GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other			<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Sample ID</th> <th rowspan="2">Sample Type</th> <th rowspan="2">Sampler's Initials</th> <th rowspan="2">Date Time Collected</th> <th rowspan="2">Grab</th> <th rowspan="2">Comp.</th> <th rowspan="2"># Containers</th> <th rowspan="2">Plastic(P) or Glass(G)</th> <th colspan="10">Preservative</th> <th rowspan="2">Ammonia-Nitrogen</th> <th rowspan="2">Chloride, Sulfate</th> <th rowspan="2">Specific Conductivity</th> <th rowspan="2">Nitrate, Nitrite</th> <th rowspan="2">Groundwater metals</th> <th rowspan="2">Surfacewater metals</th> <th rowspan="2">Sediment: Al/Cr/Fe</th> <th rowspan="2">Other</th> <th rowspan="2">Other</th> <th rowspan="2">Other</th> <th rowspan="2">Other</th> <th rowspan="2">Other</th> <th rowspan="2">Other</th> </tr> <tr> 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OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date Chris Ricciardi 7/22/09
Sr. Review/Date Chris Ricciardi 8/26/09
Lab Report # 360-226SD-1
Project # 60709006

chloride sulfate ammonia, specific conductance

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification - Field and Laboratory
(IDs must be cross-referenced)
☒ Client Information: ☒ Name ☒ Address ☒ Client Contact

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Does the laboratory report include a completed Analytical Report Certification in the required format? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☐ Narrative includes an explanation of each discrepancy on the Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed? Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

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Yes ☒ No ☐ N/A ☐ Comments:

☒ Sample temperature confirmed: must be 1° - 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☒ Container type noted ☒ Condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Yes ☒ No ☐ N/A ☐ Comments:

☒ Ammonia, - 1 Liter polyethylene/H₂SO₄ to pH<2, cool to 4°C

Oil & Grease - 1 Liter glass/HCL or H₂SO₄ to pH<2, cool to 4°C

Alkalinity - 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand - 50 mL polyethylene/H₂SO₄ to pH<2, cool to 4°C

☒ Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C

Nitrate/nitrite - H₂SO₄ to pH<2, cool to 4°C

Organic Carbon - 500 mL amber glass bottle/HCL or H₂SO₄ to pH<2, cool to 4°C

Sulfide - 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H₂SO₄ to pH<2, cool to 4°C

☒ Specific conductance, TDS, TSS - 100 mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.3 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

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1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?

<input checked="" type="checkbox"/> Field ID and Lab ID	<input checked="" type="checkbox"/> Date and time collected	<input checked="" type="checkbox"/> Analyst Initials	<input checked="" type="checkbox"/> Dilution Factor	<input checked="" type="checkbox"/> % moisture or solids	<input checked="" type="checkbox"/> Reporting limits
<input checked="" type="checkbox"/> Clean-up method	<input checked="" type="checkbox"/> Analysis method	<input checked="" type="checkbox"/> Preparation method	<input checked="" type="checkbox"/> Date of preparation/extraction/digestion	<input checked="" type="checkbox"/> clean-up and analysis, where applicable	
<input checked="" type="checkbox"/> Matrix	<input checked="" type="checkbox"/> Target analytes and concentrations		<input checked="" type="checkbox"/> Units (soils must be reported in dry weight)		

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch?

☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

<input checked="" type="checkbox"/> 28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate	
Alkalinity = 14 days	Sulfide, TDS, TSS = 7 days
Nitrite nitrogen as N = 48 hrs	Nitrate + Nitrite as N = 28 days
	pH = analyze immediately
	Nitrate nitrogen as N = 48 hrs

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method

3.1 Was the correct laboratory method used?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

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3.2 Are the practical quantitation limits the same as those specified by the ☐ QAPP/IRSWP ☐ Lab? Yes ☐ No ☒ N/A ☐ Comments:

The lab reported a PQL for specific conductance of 1 umhos/cm. No action required.

Note: The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.

Ammonia* <input checked="" type="checkbox"/> = 0.1 mg/L	Alkalinity** <input type="checkbox"/> = 1 mg/L	Bicarbonate Alkalinity** <input type="checkbox"/> = 1 mg/L	Carbonate Alkalinity** <input type="checkbox"/> = 1 mg/L
Nitrate Nitrogen as N* <input type="checkbox"/> = .05 mg/L	Nitrite Nitrogen as N* <input type="checkbox"/> = .01 mg/L	Chloride* <input checked="" type="checkbox"/> = 1 mg/L	Hardness * <input type="checkbox"/> = 2 mg/L
Spec. Cond.** <input checked="" type="checkbox"/> 3 umhos/cm	Total Organic Carbon** <input type="checkbox"/> = 1 mg/L	Oil & Grease* <input type="checkbox"/> = 5.5 mg/L	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 2 mg/L
COD:* Low - 20 mg/L	COD* High - 50 mg/L <input type="checkbox"/>	TDS* <input type="checkbox"/> = 10 mg/L	TSS* <input type="checkbox"/> = 5 mg/L
pH* <input type="checkbox"/> < 2 to > 12	Phenolic - 0.01 mg/L		
Other parameter(list) _____	PQL = _____ <input type="checkbox"/> Source of PQL = _____		
Other parameter(list) _____	PQL = _____ <input type="checkbox"/> Source of PQL = _____		

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

Yes ☒ No ☐ N/A ☐ Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? Yes ☒ No ☐ N/A ☐ Comments:

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ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs). Yes ☒ No ☐ N/A ☐ Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following: Yes ☐ No ☒ N/A ☐ Comments:

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times$ blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits? Yes ☐ No ☒ N/A ☐ Comments:

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LCS Limits:

Alkalinity** <input type="checkbox"/> = 80-120%	Bicarbonate Alkalinity** <input type="checkbox"/> = 80-120%	Carbonate Alkalinity** <input type="checkbox"/> = 80-120%	Specific Conductivity * <input type="checkbox"/> = 80-120%
Total Organic Carbon** <input type="checkbox"/> = 80-120%	TDS** <input type="checkbox"/> = 80-120%	Oil & Grease* <input type="checkbox"/> = 80-120%	Ammonia Nitrogen as N* <input type="checkbox"/> = 80-120%
COD Low* <input type="checkbox"/> = 80-120%	COD High* <input type="checkbox"/> = 80-120%	Nitrate Nitrogen as N** <input type="checkbox"/> = 80-120%	Nitrite Nitrogen as N** <input type="checkbox"/> = 80-120%
Hardness* <input type="checkbox"/> = 80-120%	Chloride* <input checked="" type="checkbox"/> = 80-120%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 80-120%	pH* <input type="checkbox"/> = 98-102% TSS* NA
Other parameter(list) _____	%R = _____	<input type="checkbox"/> Rec Limits= _____	
Other parameter(list) _____	%R = _____	<input type="checkbox"/> Rec Limits = _____	

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

ACTION: If any matrix spike data is missing, call lab for resubmission.

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

The MSD percent recovery for ammonia (160) *is greater than the upper QC limit of 125*

Yes ☒ No ☐ N/A ☐ Comments: Sample OL-6W-34D was submitted for des/mss only. The sub performed so that we did not submit des/mss only on sample OL-P216 RR.

Yes ☒ No ☐ N/A ☐ Comments:

Yes ☐ No ☒ N/A ☐ Comments:

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NOTE: %R = $\frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result SR = Sample result

SA = Spike added

MS/MSD Recovery Limits:

Alkalinity* = NA Bicarbonate Alkalinity* = NA Carbonate alkalinity* = NA Ammonia* (LACHAT) ☒ = 75-125%
 Chloride*(SM 4500 Cl) ☒ = 75-125% Specific Conductivity* = NA Total Organic Carbon* = NA TDS** = NA
 Oil & Grease* = NA COD Low* ☐ = 75-125% COD High* ☐ = 75-125% Nitrate Nitrogen as N** ☐ = 75-125%
 Nitrite Nitrogen as N** ☐ = 75-125% Hardness* ☐ = 75-125% Sulfate (EPA 300.0)* ☒ = 75-125% pH* = NA TSS* = NA
 Other parameter(list) _____ % R = _____ ☐ Rec Limits = _____

* = Laboratory Limits

** = Olin QAPP Limits (MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
 2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where S = MS result Yes ☒ No ☐ N/A ☐ Comments: The ammonia MS/MSD RPD (25) exceeds the QC limit of 20. The result for ammonia in the unspiked sample OC-GW-340 and OC-GW-340DUP were carefully estimated (J).

MS/MSD RPD Limits:

RPD ≤ 20

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes ☒ No ☐ N/A ☐ Comments:

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ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3% Specific Conductivity * ☒ = 5% TSS** ☐ = 6% TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.
 If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

NOTE: MADEP does not require the collection of rinsate blanks.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒ No ☐ N/A ☐ Comments: Sample

OC-GW-340 and OC-GW-340 DUP

9.2 Were field duplicates collected per the required frequency?

Yes ☒ No ☐ N/A ☐ Comments:

QAPP/IRSWP ☒ MADEP Option 1(1 per 20) ☒ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 30\%$ for waters $\leq 50\%$ for soils? Calculate the RPD for results and attach to this review.

Yes ☒ No ☐ N/A ☐ Comments:

		(%)	
OC-GW-340	Units	ORIG	RPD
Chloride	mg/L	14	15
Ammonia	mg/L	15	14
Sulfate	mg/L	37	38
Spec Cond	Microhm/cm	210	210
page 7		0	

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ACTION: Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes ☒

No ☐

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Earnes Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1.; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

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ICP METALS BY METHOD 6010B/200.7

Reviewer/Date Chris Ricardy 7/28/09
 Sr. Review/Date Chris Ricardy 8/24/09
 Lab Report # 360-2265P-1
 Project # 4107090016

disolved aluminum and chromium

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:

Check items received.

<input checked="" type="checkbox"/> Name of Laboratory	<input checked="" type="checkbox"/> Address	<input checked="" type="checkbox"/> Project ID	<input checked="" type="checkbox"/> Phone #	<input checked="" type="checkbox"/> Sample identification – Field and Laboratory
Client Information:	<input checked="" type="checkbox"/> Name	<input checked="" type="checkbox"/> Address	<input checked="" type="checkbox"/> Client Contact	(IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☐ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the original COC.

ACTION: If no, contact lab for submission of copy of completed COC.

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1.5 Sample Receipt Information (Cooler Receipt Form present?):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☐ sample condition observed ☒ pH verified (where applicable) ☐ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?

- ☒ Field ID and Lab ID ☒ Date and time collected ☒ Analyst Initials ☒ Dilution Factor ☒ % moisture or solids ☒ Reporting limits
- ☒ Clean-up method ☒ Analysis method ☒ Preparation method ☒ Date of preparation/extraction/digestion clean-up and analysis, where applicable
- ☒ Matrix ☒ Target analytes and concentrations ☒ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

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☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion	3005A or 3010A or 3020A
Soil Digestion	3050B
Metals	6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☐ SOW ☒ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

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ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: *MADEP requires the method blank to be matrix matched and digested with the samples*

4.4 Do any method blanks have positive results for metals? Qualify data according to the following: Yes ☐ No ☒ N/A ☐ Comments:

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If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "J" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5 \times$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A *full target*, *second source LCS* is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP
Water	% Rec
Soil	80-120

within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-detect results are rejected (R).

Comments:

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6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

- ### 6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

- ## 6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

- ### 6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

- #### 6.4 Are any metal spike recoveries outside of the QC limits?

Sample Type	MADEP % Rec	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: %R = $\frac{(SSR-SR)}{SA} \times 100\%$ Where: SSR = Spiked sample result
SA = Sample result SR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations ($> 4X$ spike), the data are evaluated, but no flags are applied.

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NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes ☐ No ☒ N/A ☐ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? Yes ☐ No ☒ N/A ☐ Comments:

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits? Yes ☐ No ☐ N/A ☒ Comments:

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<u>MADEP Laboratory Duplicate Sample RPD Criteria:</u>	<u>QAPP RPD</u>
<i>For aqueous results > 5x RL, RPD must be ± 20%</i>	20
<i>For aqueous results < 5x RL, RPD must be ≤ RL</i>	20
<i>For soil/sediment results > 5x RL, RPD must be ± 35%</i>	20
<i>For soil/sediment results < 5x RL, RPD must be ≤ 2x RL</i>	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinseate blanks collected? Prior to evaluating rinseate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinseate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP does not require the collection of rinseate blanks.

ACTION: Evaluate rinseate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒ No ☐ N/A ☐ Comments:

Sample OC-GW-34D and field
 Duplicate OC-GW-34D DUP

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9.2 Were field duplicates collected per the required frequency?

Yes ☒ No ☐ N/A ☐ Comments:

SOW ☐ QAPP (1 per 10) ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 50\%$ for soils or waters? Calculate the RPD for all results and attach to this review.

Yes ☒ No ☐ N/A ☐ Comments:

OC-GW-340	orig conc (ug/L)	DUP conc (ug/L)	(2) RPD
dissolved aluminum	4.0	4.7	16
dissolved chromium	13	13	0

ACTION: RPD must be $\leq 50\%$ for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.

Yes ☐ No ☒ N/A ☐ Comments:

ACTION: If results for both total and dissolved are $\geq 5x$ the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

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10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag** pages for entry in database.

REFERENCES

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U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.